

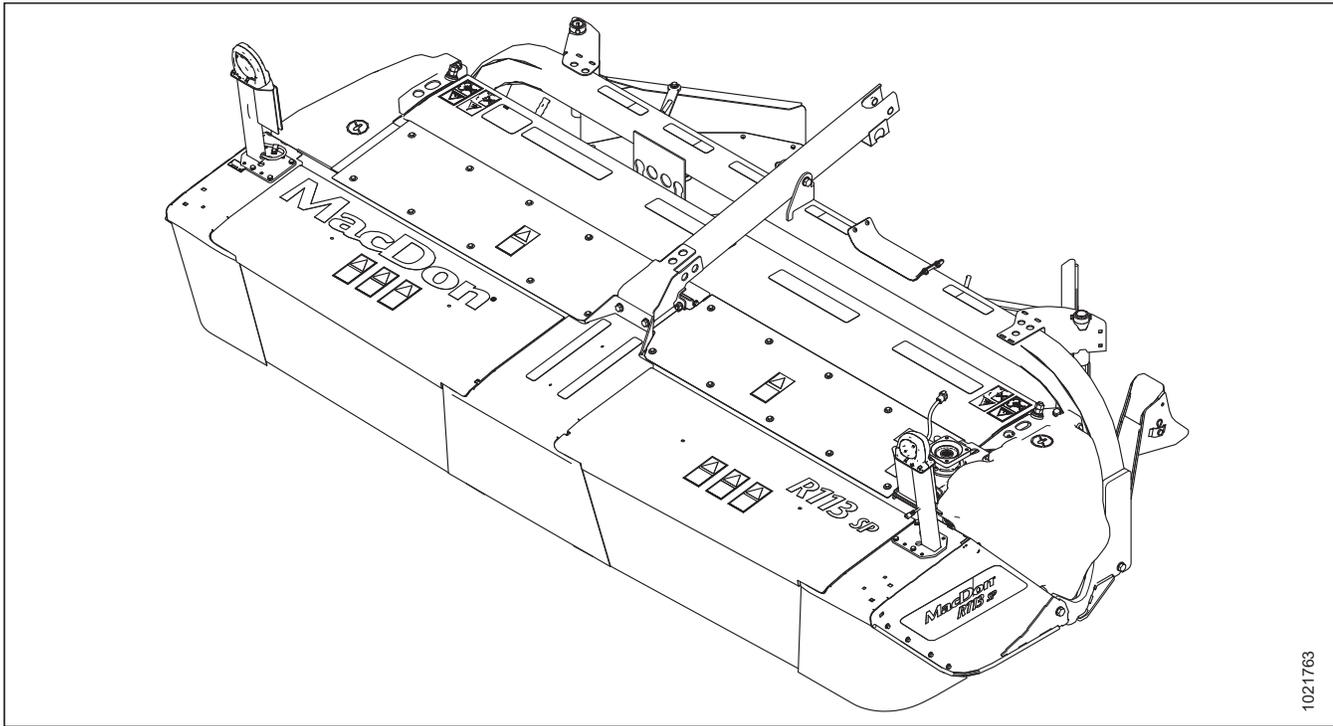
# **R113 and R116 Rotary Disc Header**

Unloading and Assembly Instructions

215368 Revision A

Original Instruction

## R113 Rotary Disc Header



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## Introduction

This instruction describes the unloading, setup, and predelivery requirements for the MacDon R113 Rotary Disc Header and R116 Rotary Disc Header.

To ensure your customers receive all of the performance and safety benefits from this product, carefully follow the unloading and assembly procedure from the beginning through to completion.

Retain this instruction for future reference.

**Carefully read all the material provided before attempting to unload, assemble, or use the machine.**

### ***Conventions***

The following conventions are followed in this document:

- Right and left are determined from the operator's position, facing the direction of travel.
- Unless otherwise noted, use the standard torque values provided in this manual.

### **NOTE:**

Keep your MacDon publications up-to-date. The most current version can be downloaded from our website ([www.macdon.com](http://www.macdon.com)) or from our Dealer-only site (<https://portal.macdon.com>) (login required).

This instruction is available in English only.

## Summary of Changes

This list covers changes made since the last revision.

Section	Summary of Change	Internal Use Only
Throughout manual	Added R116 Rotary Disc Header content.	Tech Pubs
<i>2 Unloading the Header, page 7</i>	Added image of tipping hooks and new decal.	ECN 58772
—	Removed topics for unpacking hydraulic hoses on headers and installing hose support for M155E4 because the hydraulics bundle is shipped separately with separate instructions.	ECN 59076
<i>3.4 Installing Hydraulic Header Drive, page 15</i>	Added topic directing the user to the hydraulic drive installation instructions.	ECN 59076
<i>4 Changing the Conditioner, page 17</i>	Moved this chapter and its topics before attaching header to windrower.	Tech Pubs
<i>5 Attaching Rotary Disc Header to Windrower, page 31</i>	Added links to specific windrower instructions.	Tech Pubs
<i>6.2 Connecting R1 Series Rotary Disc Header Hydraulics and Electrical to M1170 Windrowers, page 52</i>	Removed steps to assemble the pressure hose because it's covered in the hydraulic drive kit instruction.	Product Support
<i>6.4 Connecting R113 Rotary Disc Header Hydraulic and Electrical to M205 Windrower, page 64</i>	Added topic to advise of kit MD #257188 for connecting R113 SP to M205 Windrower.	ECN 59549

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# Chapter 1: Safety

## 1.1 Signal Words

Three signal words, **DANGER**, **WARNING**, and **CAUTION**, are used to alert you to hazardous situations. Two signal words, **IMPORTANT** and **NOTE**, identify non-safety related information. Signal words are selected using the following guidelines:

### **DANGER**

Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury.

### **WARNING**

Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury. It may also be used to alert against unsafe practices.

### **CAUTION**

Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may be used to alert against unsafe practices.

#### **IMPORTANT:**

Indicates a situation that, if not avoided, could result in a malfunction or damage to the machine.

#### **NOTE:**

Provides additional information or advice.

## 1.2 General Safety

### CAUTION

The following general farm safety precautions should be part of your operating procedure for all types of machinery.

Protect yourself when assembling, operating, and servicing machinery, wear all protective clothing and personal safety devices that could be necessary for the job at hand. Do **NOT** take chances. You may need the following:

- Hard hat
- Protective footwear with slip-resistant soles
- Protective glasses or goggles
- Heavy gloves
- Wet weather gear
- Respirator or filter mask

In addition, take the following precautions:

- Be aware that exposure to loud noises can cause hearing impairment or loss. Wear suitable hearing protection devices such as earmuffs or earplugs to help protect against loud noises.



Figure 1.1: Safety Equipment



Figure 1.2: Safety Equipment

- Provide a first aid kit in case of emergencies.
- Keep a properly maintained fire extinguisher on the machine. Be familiar with its proper use.
- Keep young children away from machinery at all times.
- Be aware that accidents often happen when the Operator is tired or in a hurry. Take time to consider the safest way. **NEVER** ignore warning signs of fatigue.

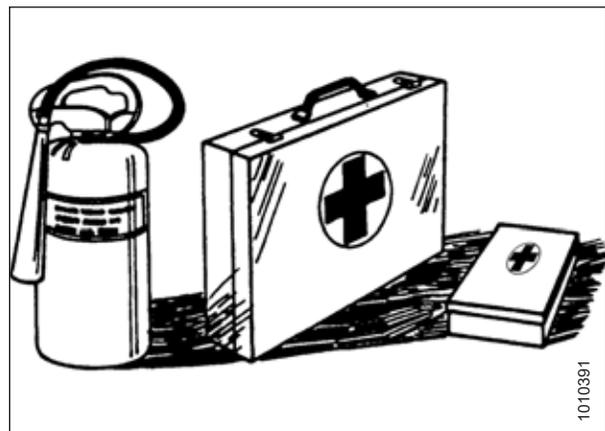


Figure 1.3: Safety Equipment

## SAFETY

- Wear close-fitting clothing and cover long hair. **NEVER** wear dangling items such as scarves or bracelets.
- Keep all shields in place. **NEVER** alter or remove safety equipment. Make sure driveline guards can rotate independently of shaft and can telescope freely.
- Use only service and repair parts made or approved by equipment manufacturer. Substituted parts may not meet strength, design, or safety requirements.



Figure 1.4: Safety around Equipment

- Keep hands, feet, clothing, and hair away from moving parts. **NEVER** attempt to clear obstructions or objects from a machine while the engine is running.
- Do **NOT** modify the machine. Unauthorized modifications may impair machine function and/or safety. It may also shorten the machine's life.
- To avoid injury or death from unexpected startup of the machine, **ALWAYS** stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

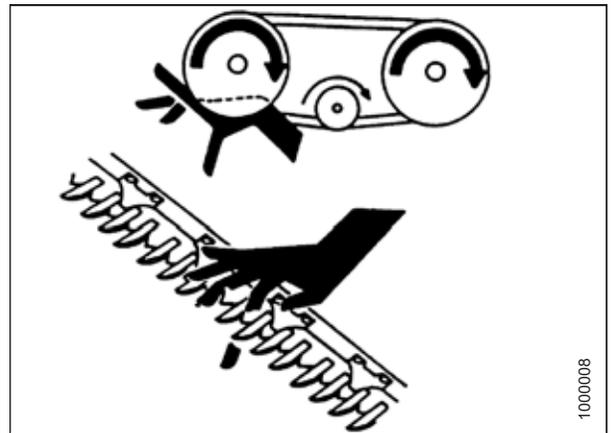


Figure 1.5: Safety around Equipment

- Keep service area clean and dry. Wet and/or oily floors are slippery. Wet spots can be dangerous when working with electrical equipment. Be sure all electrical outlets and tools are properly grounded.
- Keep work area well lit.
- Keep machinery clean. Straw and chaff on a hot engine are fire hazards. Do **NOT** allow oil or grease to accumulate on service platforms, ladders, or controls. Clean machines before storage.
- **NEVER** use gasoline, naphtha, or any volatile material for cleaning purposes. These materials may be toxic and/or flammable.
- When storing machinery, cover sharp or extending components to prevent injury from accidental contact.



Figure 1.6: Safety around Equipment

## 1.3 Welding Precaution

To prevent damage to sensitive electronics, welding should never be attempted on the rotary disc header while it is connected to a windrower.

### WARNING

**Severe damage to sensitive, expensive electronics can result from welding on the header while it is connected to the windrower. It can be impossible to know what effect high current could have with regard to future malfunctions or shorter lifespan. It is very important that welding on the header is not attempted while the header is connected to the windrower.**

If it is unfeasible to disconnect the rotary disc header from the windrower before welding, refer to the windrower's technical manual for welding precautions detailing all electrical components that must be disconnected first for safe welding.

## 1.4 Safety Signs

- Keep safety signs clean and legible at all times.
- Replace safety signs that are missing or illegible.
- If the original part on which a safety sign was installed is replaced, be sure the repair part displays the current safety sign.

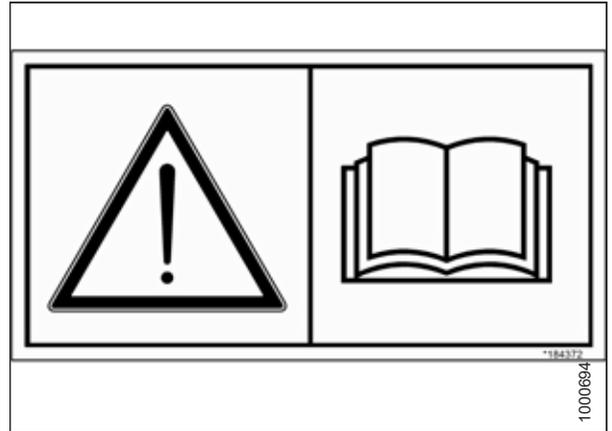


Figure 1.7: Operator's Manual Decal



## Chapter 2: Unloading the Header

### CAUTION

To avoid injury to bystanders from being struck by machinery, do NOT allow people to stand in unloading area.

### CAUTION

Equipment used for unloading must meet or exceed the requirements specified below. Using inadequate equipment may result in chain breakage, vehicle tipping, or machine damage.

Table 2.1 Lifting Vehicle

Minimum Capacity <sup>1</sup>	3630 kg (8000 lb.)
Minimum Fork Length	198 cm (78 in.)

#### IMPORTANT:

Forklifts are normally rated for a load located 610 mm (24 in.) ahead of the back end of the forks. To obtain the forklift capacity at 1220 mm (48 in.), check with your forklift distributor.

#### IMPORTANT:

Do NOT lift at hooks (A) when unloading from trailer. Hooks (A) are ONLY for tipping the machine over to working position.

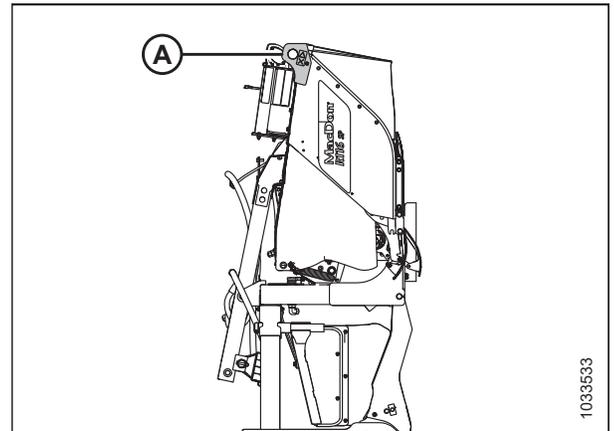


Figure 2.1: Lifting Header off Trailer

### WARNING

Be sure forks are secure before moving away from load. Stand clear when lifting.

1. At 1220 mm (48 in.) from back end of forks.

## UNLOADING THE HEADER

1. Remove hauler's tie-down straps and chains.
2. Approach the header from its underside and slide the forks under the lifting framework as far as possible.

**IMPORTANT:**

Do **NOT** damage the hydraulic hoses hanging below the header.

3. Raise the header off the deck.

**IMPORTANT:**

If unloading a header from a two-unit load, avoid damage to the other header.

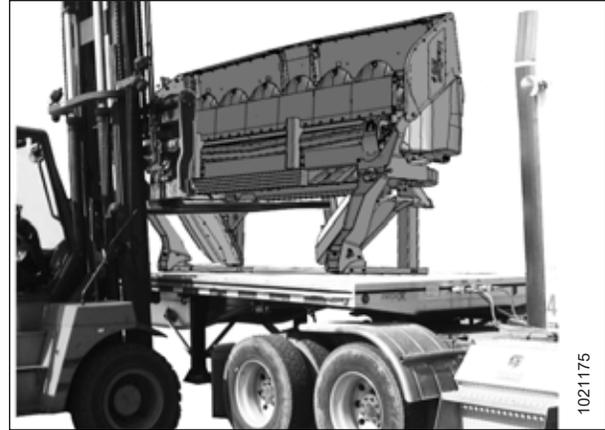


Figure 2.2: Lifting Header off Trailer

4. Back up until the header clears the trailer, and then slowly lower to 150 mm (6 in.) from the ground.
5. Take header to the storage or setup area.
6. Set header down on secure, level ground.
7. Check for shipping damage and missing parts.

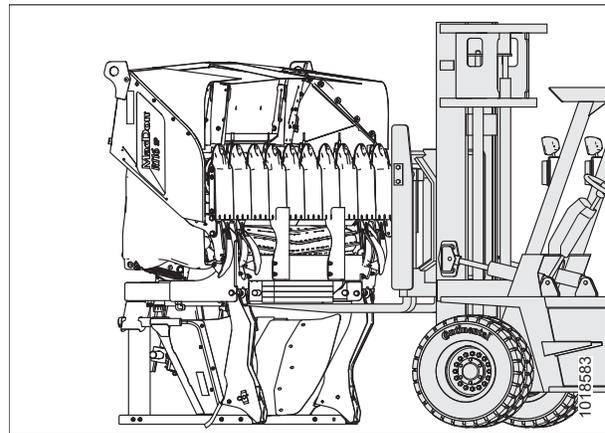


Figure 2.3: Moving Header with Forklift

## Chapter 3: Assembling the Header

Follow each procedure in this chapter in order.

### 3.1 Removing Lower Shipping Support

1. Support wood brace (B), cut three shipping straps (A), and then remove the wood brace.

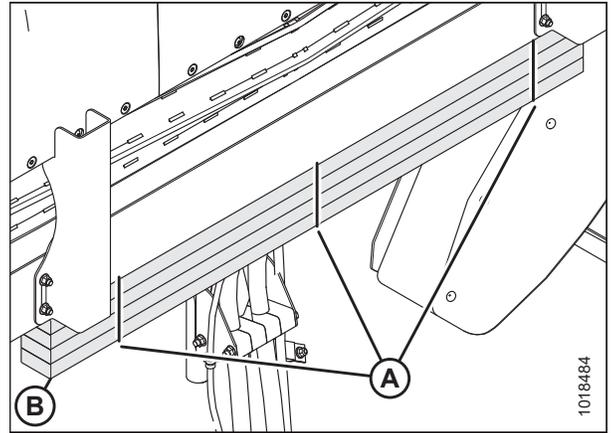


Figure 3.1: Shipping Support

2. Remove four bolts (A) on both vertical fork channels (B), and then remove vertical fork channels.

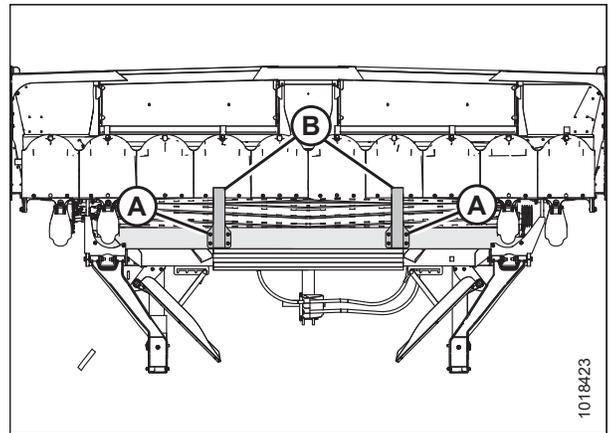


Figure 3.2: Vertical Fork Channels

**NOTE:**

R113 SP headers have one skid shoe per side; R116 SP headers have two.

3. Remove bolt (A) at skid shoe (B) (inner skid shoe on R116 SP). Retain bolt for reinstallation.

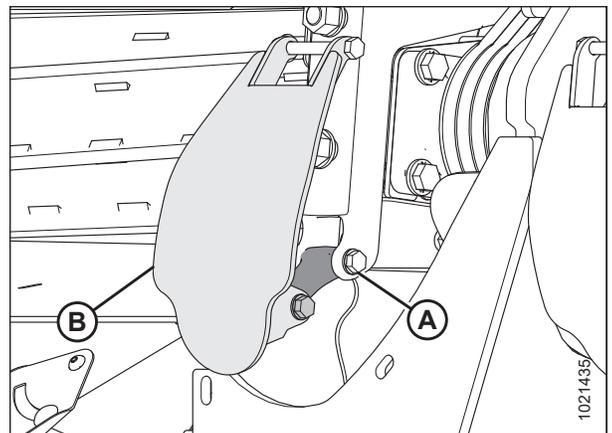


Figure 3.3: R113 SP Left Skid Shoe Shown

## ASSEMBLING THE HEADER

4. Lift skid shoe (B) out of the way and support it with wire (A). Repeat for opposite skid shoe.

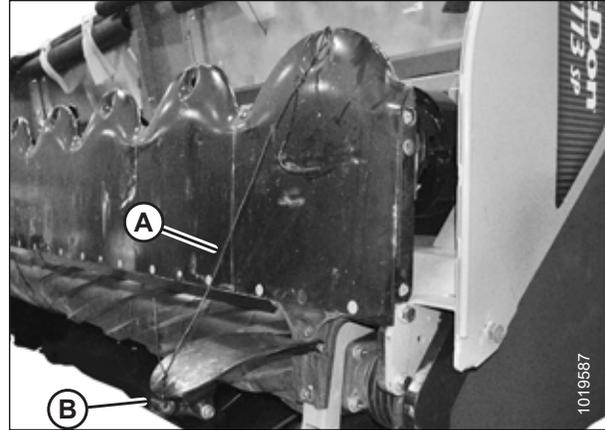


Figure 3.4: R113 Left Skid Shoe Shown

5. Remove three bolts (A) per side on base support (B). Repeat at opposite end of base support.

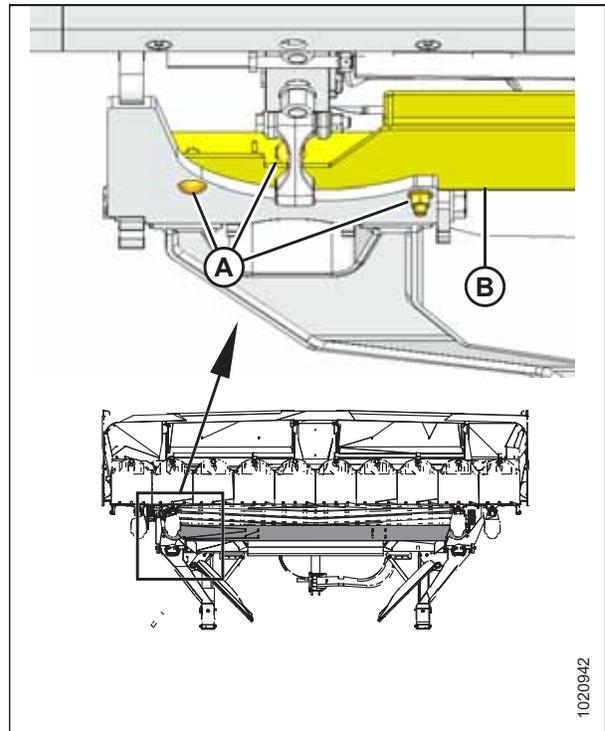


Figure 3.5: Base Shipping Support – Right Side Shown

## ASSEMBLING THE HEADER

6. Remove base support (A).

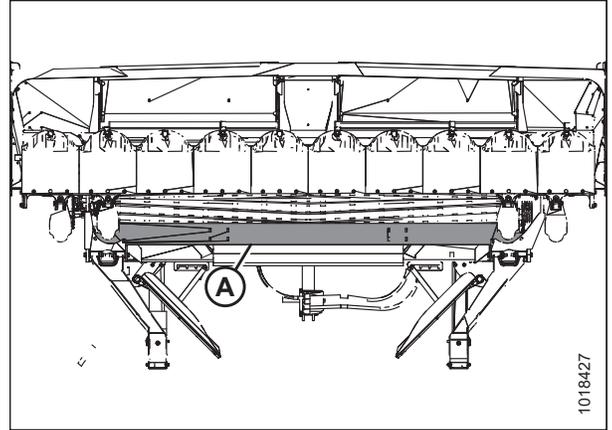


Figure 3.6: Base Shipping Support

7. Remove wire (A) holding skid shoe (B).

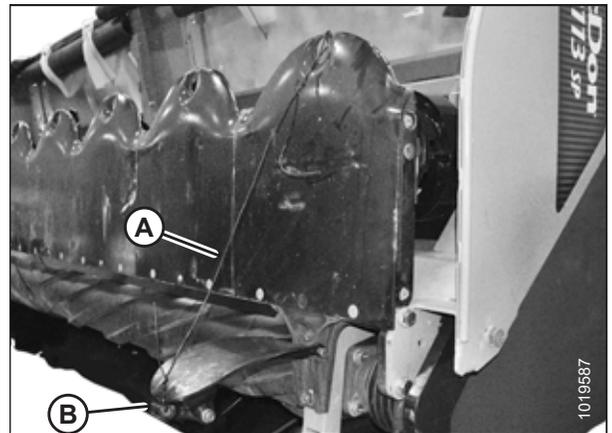


Figure 3.7: R113 SP Left Skid Shoe Shown

8. Tilt skid shoe (B) inward, and align link (A) with the mounting hole in the skid shoe.
9. Install bolt, washer, and nut (C).
10. Push the skid shoe towards the header, and tighten nut (C).
11. Repeat Steps 7, [page 11](#) to 10, [page 11](#) for the opposite side.

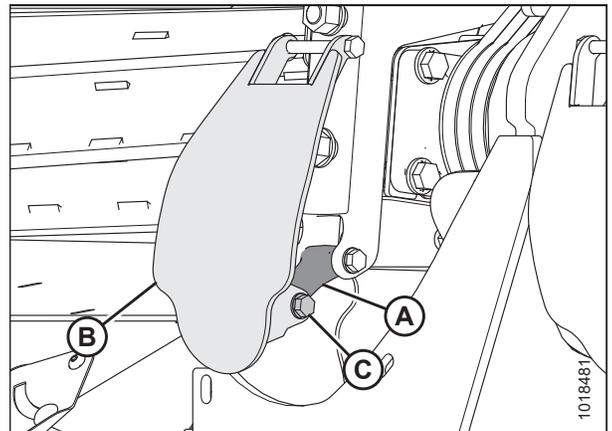


Figure 3.8: R113 SP Left Skid Shoe Shown

### 3.2 Lowering the Header

**⚠ CAUTION**

Ensure spreader bar is secured to the forks so that it cannot slide off the forks or towards the mast as the header is lowered to the ground.

Table 3.1 Lifting Vehicle

Chain Type	Overhead lifting quality, 13 mm (1/2 in.)
Minimum Working Load	2270 kg (5000 lb.)

1. Attach spreader bar (A) to forks.  
**IMPORTANT:**  
Length of spreader bar must be approximately 4600 mm (180 in.).
2. Drive lifting vehicle to approach the header from its underside.
3. Attach chains to hooks (B) on either side of the header.

**IMPORTANT:**  
Do **NOT** lift at hooks when unloading from trailer. This procedure is only for laying the machine over into working position.

**IMPORTANT:**  
Chain length must be sufficient to provide a minimum 1220 mm (48 in.) (C) between spreader bar and header.

4. Raise forks until lift chains are fully tensioned.

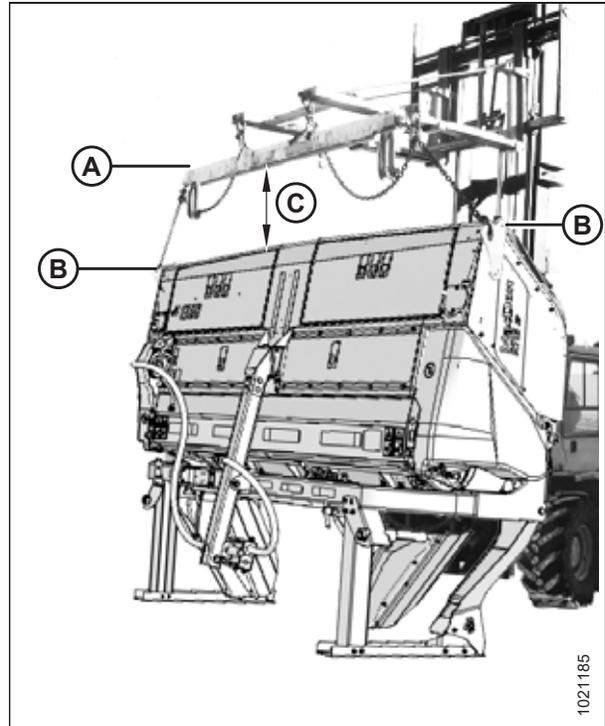


Figure 3.9: Spreader Bar Attached to Header

**⚠ CAUTION**

Stand clear when lowering the disc header.

## ASSEMBLING THE HEADER

5. Back up **SLOWLY**, while simultaneously lowering the header until the cutterbar rests on the ground.
6. Remove chains from the header.

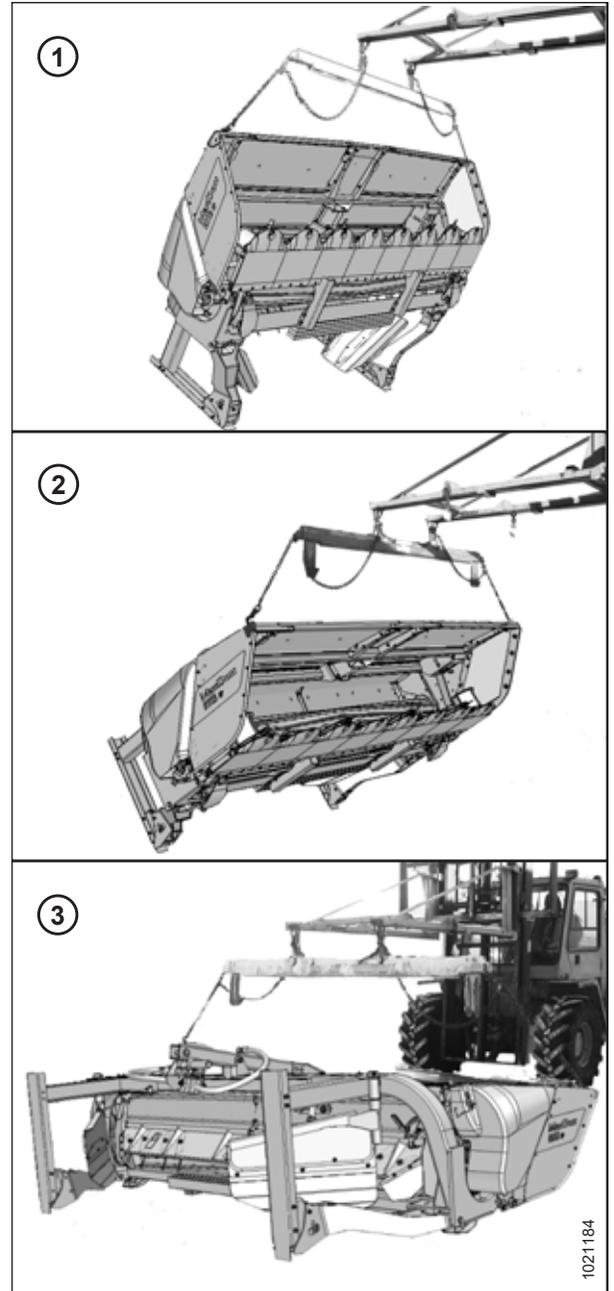


Figure 3.10: Lowering Header to the Ground

### 3.3 Removing Shipping Stands

**NOTE:**

This procedure must be completed on both sides of the header near the forming shields.

1. Remove four bolts (A).
2. Remove bolt (B).

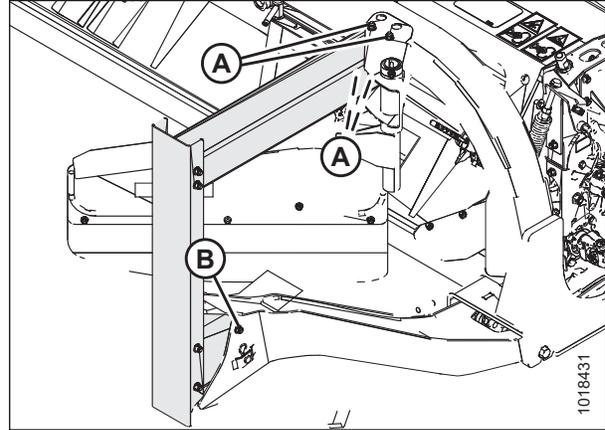


Figure 3.11: Shipping Stands – Right Side Shown, Left Side Opposite

3. Remove shipping wires from header lift boots (D).
4. Remove hair pin (A) from clevis pin (B).
5. Hold shipping stand (C) and remove clevis pin (B).
6. Remove stand (C) and discard. Reinsert pin (B) in header lift boot and secure with hair pin (A).

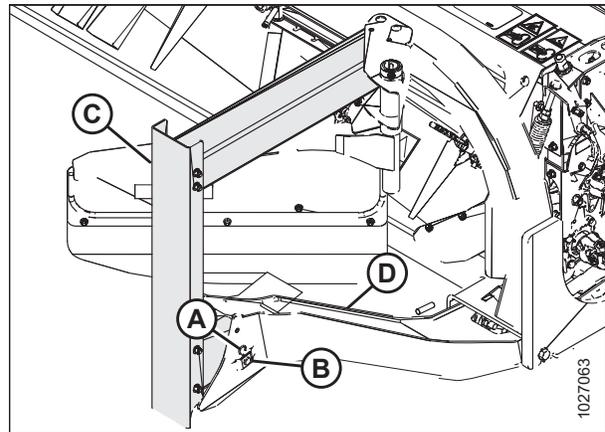


Figure 3.12: Shipping Stands – Right Side Shown

7. Remove shipping hooks (A) from front corners and reinstall hardware.

**NOTE:**

If installing tall crop divider option, do **NOT** reinstall hardware.

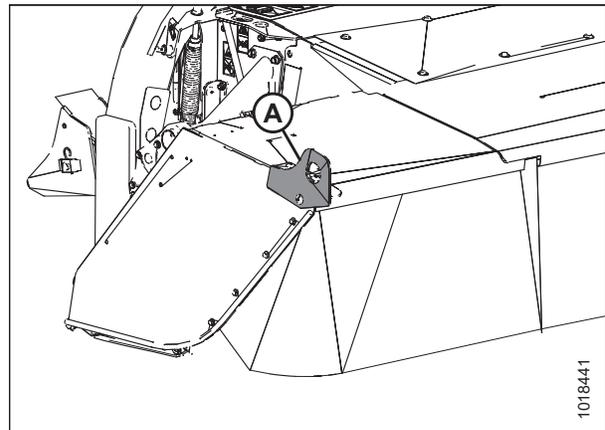


Figure 3.13: Shipping Hook

### 3.4 Installing Hydraulic Header Drive

R1 Series rotary disc headers are assembled without a hydraulic header drive. The compatible hydraulic header drive kit must be installed at this stage of the assembly.

1. Use the instructions supplied with the kit to install the compatible hydraulic header drive kit.

**Table 3.2 Hydraulic Drive Kit Compatibility**

Rotary Disc Header	Windrower	Hydraulic Drive Kit (includes install instructions)
R113 SP and R116 SP	M1170	MD #B6845
R113 SP and R116 SP	M155 <i>E4</i>	MD #B6272
R113 SP	M1240	MD #B6845 and MD #B6698

### 3.5 Assembling Hazard Lights

1. Detach hazard light bracket (A) from shipping bracket (B) by removing four bolts (C), washers (D), and nuts (E). Retain hardware for installation.

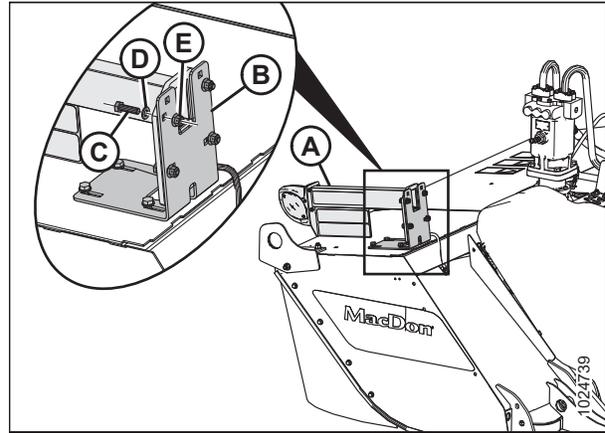


Figure 3.14: Hazard Light Shipping Bracket – Right Side

2. Detach shipping bracket (A) from header by removing four bolts (B), washers (C), and nuts (D). Discard hardware.

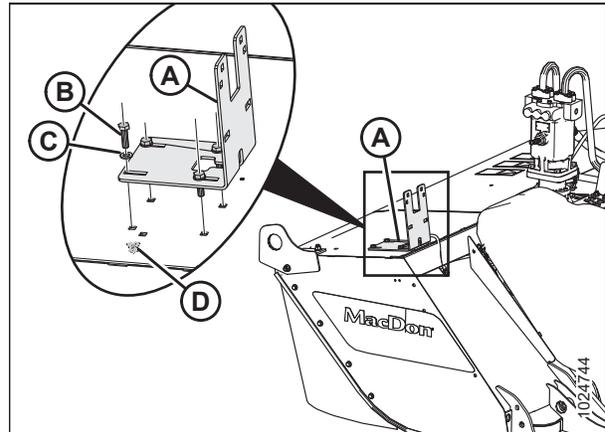


Figure 3.15: Hazard Light Shipping Bracket – Right Side

3. Install hazard light bracket (A) with hardware retained from Step 1, page 16. Install four bolts (B) and washers (C) from above, and secure with nuts (D) from below the frame.
4. Repeat on the opposite side of the machine.

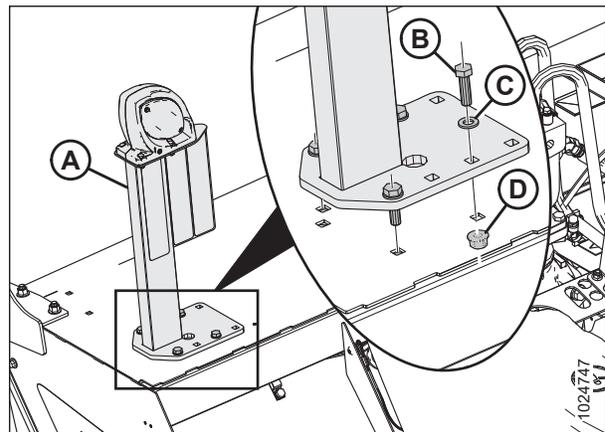


Figure 3.16: Hazard Light Shipping Bracket – Right Side

## Chapter 4: Changing the Conditioner

This section applies only to machines that require a conditioner change prior to delivery to the customer.

If a conditioner change is **NOT** required, proceed to [5 Attaching Rotary Disc Header to Windrower, page 31](#).

The R1 Series Rotary Disc Header can be operated either with no conditioner, with a polyurethane roll conditioner, or with a steel roll conditioner. If the rotary disc header is not conditioner-equipped, a shield must be installed.

### NOTE:

These instructions apply to all conditioners. Exceptions are identified where applicable.

### 4.1 Removing the Conditioner

1. Remove the driveshields.
2. Remove the conditioner drive belt. For instructions, refer to [4.3.1 Removing Conditioner Drive Belt, page 27](#).
3. **M1 Series:** Move hose bundle (A) clear of the frame and lay it on the header.

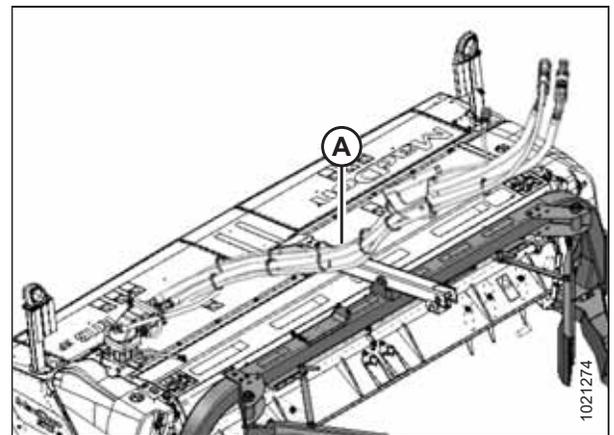


Figure 4.1: M1 Series Hose Bundle

4. **M155 and M155E4 Windrower:** Remove two bolts (A) attaching hose bracket (B) to the header frame. Place the hose bundle and bracket onto the header. Do **NOT** disconnect the hoses from the motor.

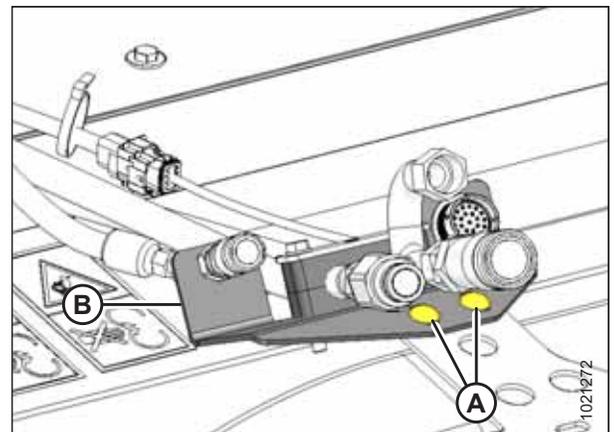


Figure 4.2: M155 and M155E4 Windrower Hoses

### WARNING

To prevent frame from slipping off forks, ensure frame is secured to forks. Failure to do so could result in death or serious injury.

5. Support and secure the adapter frame for lifting using one of the two methods below:

## CHANGING THE CONDITIONER

### Method 1:

- a. Attach straps (A) to adapter frame (B) and the forklift forks. Use straps with a minimum working load of 454 kg (1000 lb.).

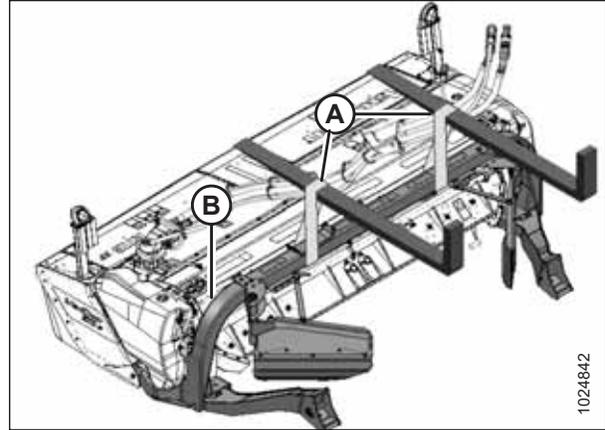


Figure 4.3: Supporting Frame Using Straps

### Method 2:

- a. To protect the finish on the frame, wrap packing foam (A) (or equivalent) around the frame at approximately the locations shown.
- b. Position forks (B) under the packing foam on the frame as shown at right. Raise forks and lift the frame slightly. The forks should **NOT** directly contact the frame.
- c. To secure the frame to the forks, wrap chain (C) around the end of the forks and attach the other end to the forklift.

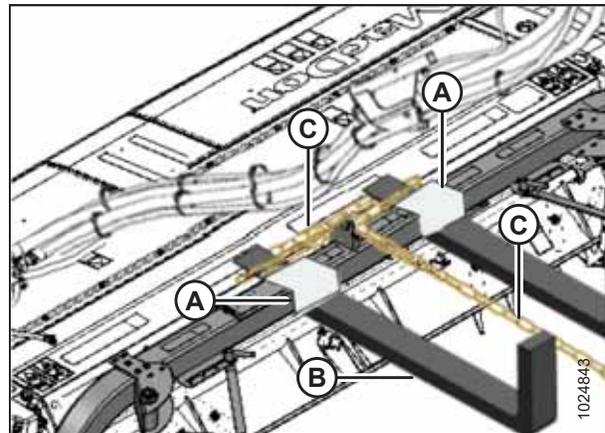


Figure 4.4: Supporting Frame Using Chain

6. Lift the header with the forklift and place 150 mm (6 in.) wooden blocks (A) under the skid shoes. Lower the header onto the blocks and allow the header to tilt forward.

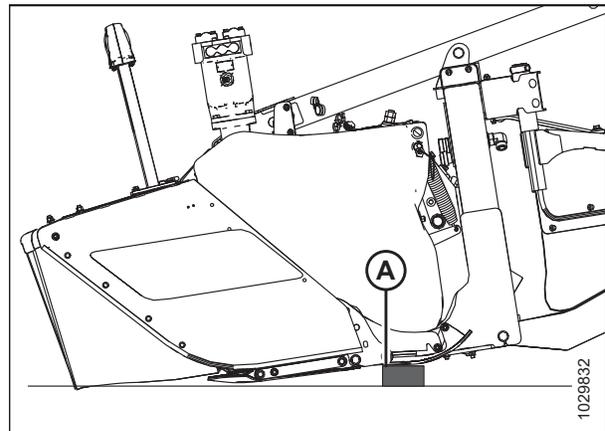


Figure 4.5: Header on Blocks

## CHANGING THE CONDITIONER

- Remove nut (A) securing bolt (B), washer (C), and washer shims (D) from the center-link support. If necessary, adjust the height of the forks lifting the frame. Retain the hardware for reinstallation.

**NOTE:**

Some transparencies are used in the illustration to help clarify the position of shims (D).

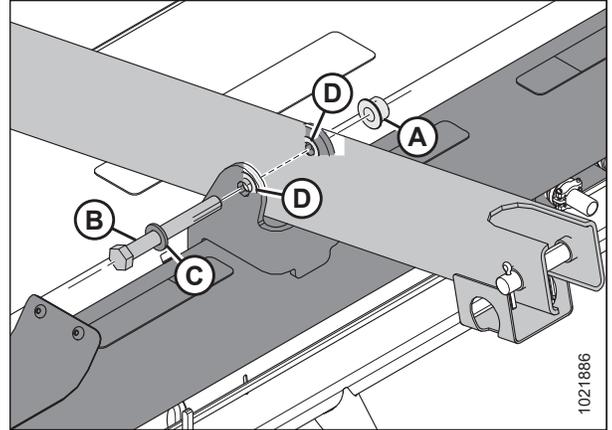


Figure 4.6: Center-Link Support

- Remove nut (B).



**WARNING**

To prevent straps from slipping off forks, ensure straps are securely attached to forks. Failure to do so could result in death or serious injury.



**CAUTION**

Stand clear when detaching frame as frame may shift when bolts are removed.

- Remove bolt (A) from frame (C). If necessary, adjust the height of the forks to improve access to bolt (A). Repeat at the opposite side of the frame. Retain the hardware for reinstallation.
- Slowly and carefully back the forklift away from the header until the frame is clear of the header. Move the frame away from the work area, lower it to the ground and disconnect it from the forklift.
- Attach spreader bar (A) to a forklift or equivalent lifting device, and attach chains to lugs (B) on conditioner (C). Use a chain rated for overhead lifting with a minimum working load of 1135 kg (2500 lb.).

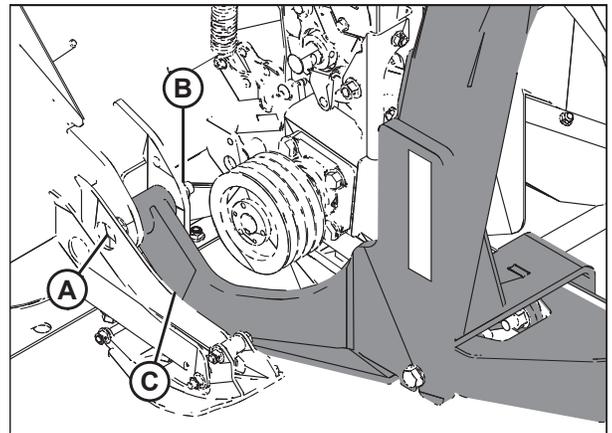


Figure 4.7: Left Side of Adapter Frame

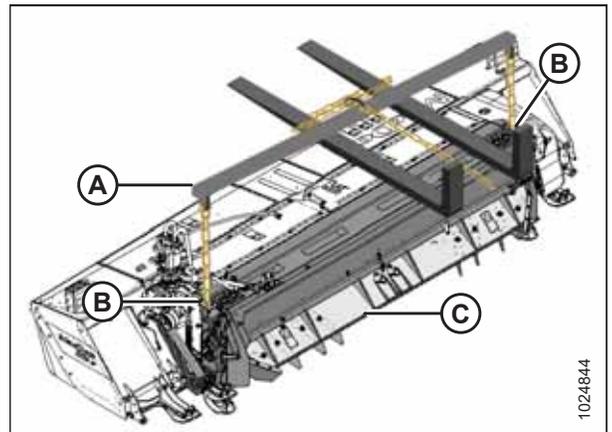


Figure 4.8: Spreader Bar

## CHANGING THE CONDITIONER

- Loosen two M16 hex head bolts (A) at each side of the conditioner that secure it to the header.

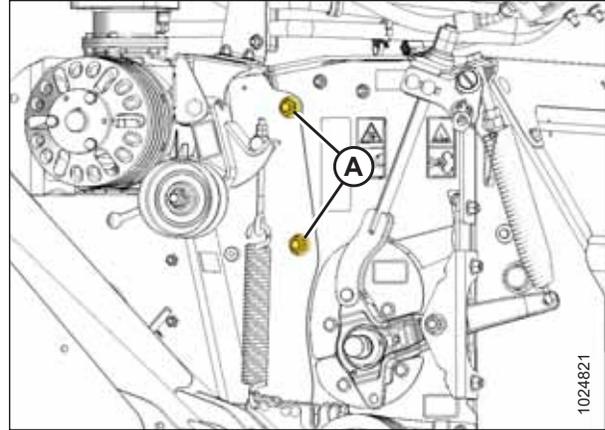


Figure 4.9: Left Side of Conditioner – Right Side Similar

- Loosen two carriage bolts (A) securing conditioner gearbox support (B) to the header.

### WARNING

To prevent the conditioner from falling backward, ensure lifting chains are secure and tight. Failure to do so may result in death or serious injury.

### CAUTION

Stand clear when detaching frame as frame may shift when bolts are removed.

- Adjust the height of the forks to raise the conditioner slightly. Remove the loosened bolts and retain hardware for reinstallation.

### WARNING

Ensure spreader bar is secured to the forks so that it cannot slide off the forks or towards the header. Failure to do so could result in death or serious injury.

- Using the forklift, lift conditioner (A) off header (B). Avoid contact between the top of the conditioner and center-link anchor (C).
- Move the frame away from the work area, set it on the ground, and remove the chains securing the conditioner to the spreader bar.

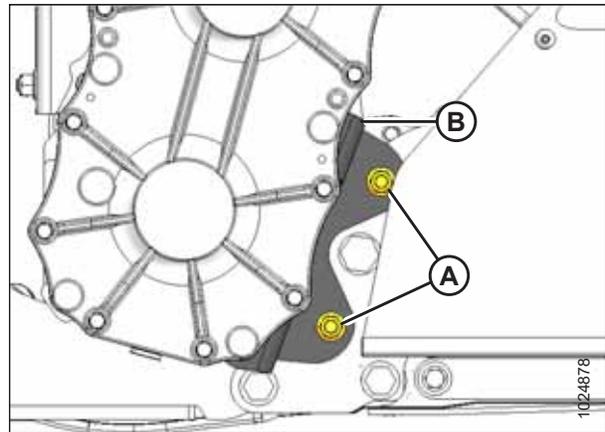


Figure 4.10: Conditioner Gearbox

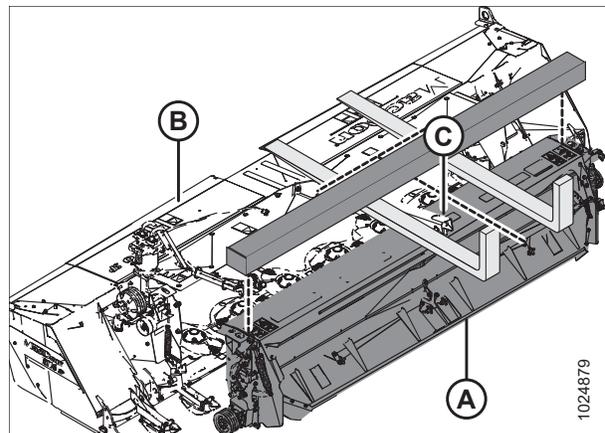


Figure 4.11: Lifting Conditioner

## 4.2 Installing the Conditioner

This procedure is applicable when the header is not attached to the windrower. If necessary, detach the header from the windrower before proceeding. Refer to the header operator's manual for instructions.

1. Attach spreader bar (A) to the forklift (or an equivalent lifting device) and attach chains to lugs (B) on the conditioner. Use a chain rated for overhead lifting with a minimum working load of 1135 kg (2500 lb.).

### WARNING

Ensure spreader bar is secured to the forks so that it cannot slide off the forks or towards the header while attaching the conditioner to the header. Failure to do so could result in death or serious injury.

2. Lift conditioner (C) and align it with the header opening.
3. Carefully align pin (B) at each end of conditioner (A) with lug (C) on the header. Lower conditioner (A) until pins (B) engage lugs (C) on the header. Avoid contact between the top of the conditioner and the center-link anchor.

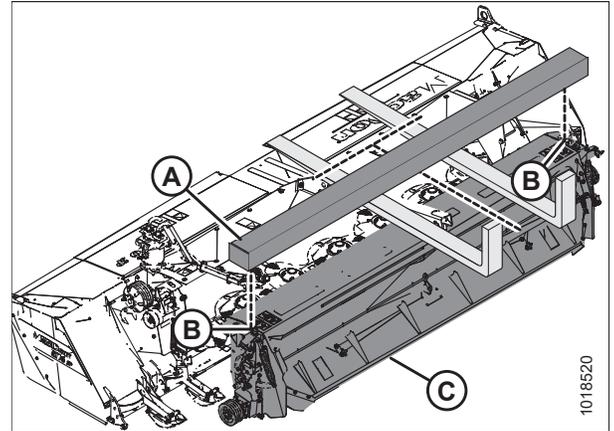


Figure 4.12: Lifting Conditioner

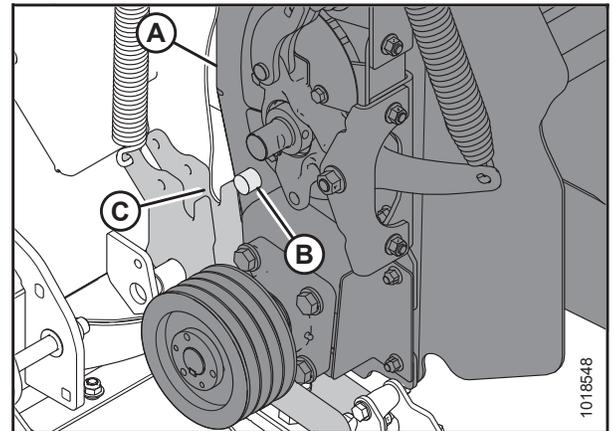


Figure 4.13: Installing Conditioner

4. Align the mounting holes and install four M16 x 40 hex head bolts (A) with the heads facing inboard (two per side). Secure with M16 center lock flanged nuts. Do **NOT** tighten.

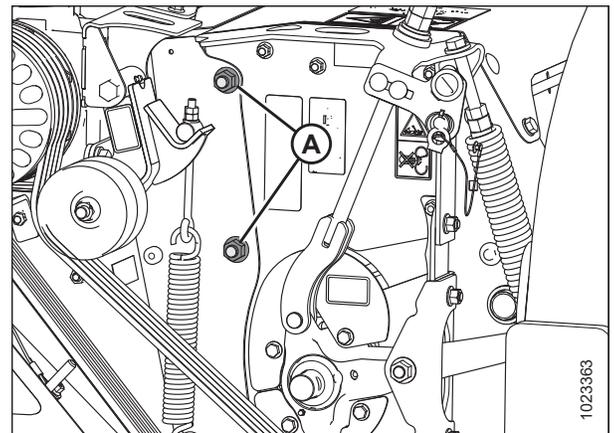


Figure 4.14: Left Side of Conditioner – Right Side Similar

## CHANGING THE CONDITIONER

- Align the holes in support (B) with the mounting holes in the header frame and install two carriage bolts (A) to secure conditioner gearbox support (B) to the header. Bolt heads face inboard. Torque nuts to 69 Nm (51 lbf-ft).

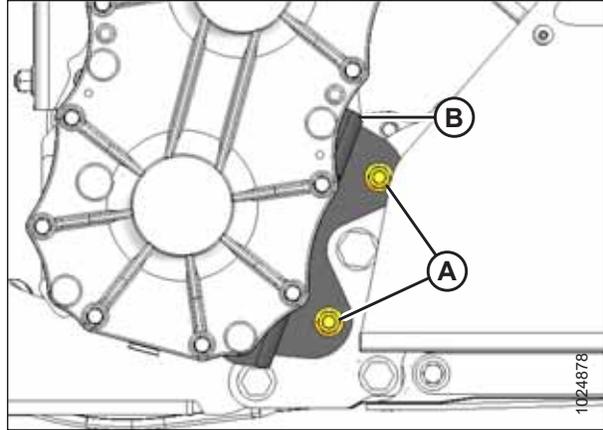


Figure 4.15: Conditioner Gearbox

- Torque nuts (A) to 170 Nm (126 lbf-ft).
- Remove the lifting chains from the conditioner and move the lifting device clear of the work area.
- If necessary, install conditioner drive components. For instructions, refer to [4.2.1 Installing Conditioner Drive, page 25](#).

### WARNING

To prevent frame from slipping off forks, ensure frame is secured to forks. Failure to do so could result in death or serious injury.

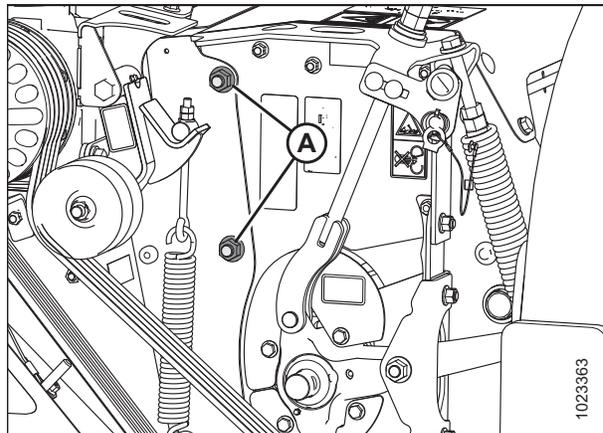


Figure 4.16: Left Side of Conditioner – Right Side Similar

- Support and secure the adapter frame for lifting using one of the two methods below:

#### **Method 1:**

- Attach straps (A) to adapter frame (B) and the forklift forks. Use straps rated for overhead lifting with a minimum working load of 454 kg (1000 lb.).
- Pick up the frame and position it against the header.

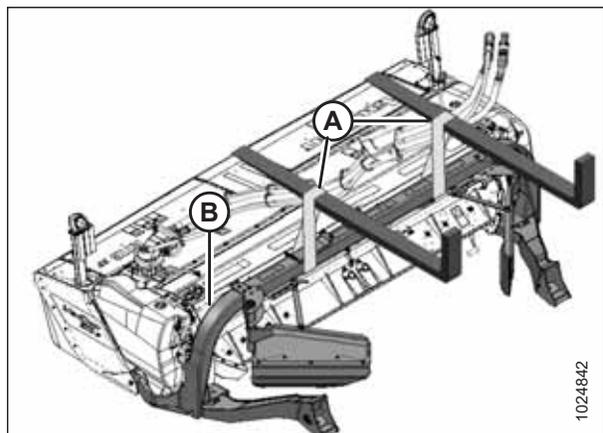


Figure 4.17: Supporting Frame Using Straps

## CHANGING THE CONDITIONER

### Method 2:

- a. To protect the finish on the frame, wrap packing foam (A) (or equivalent) around the approximate frame locations shown.
  - b. Position forks (B) under the packing foam on the frame as shown at right. Raise the forks and lift the frame slightly. The forks should not directly contact the frame.
  - c. To secure the frame to the forks, wrap chain (C) around the end of the forks and attach it to the forklift.
  - d. Pick up the frame and position it against the header.
10. Slowly move forward until lift arm (C) is aligned with mounting holes (A) and (B) in the frame.

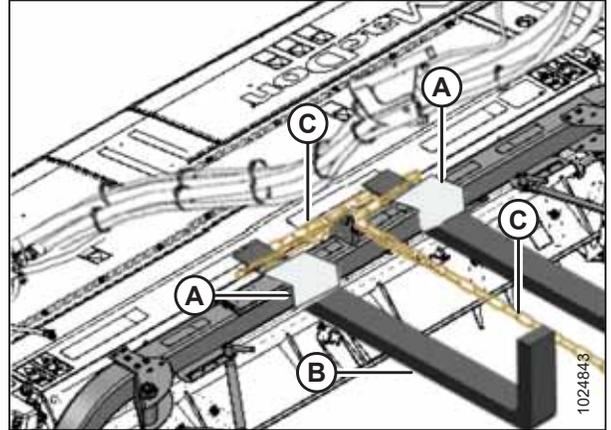


Figure 4.18: Supporting Frame Using Chain

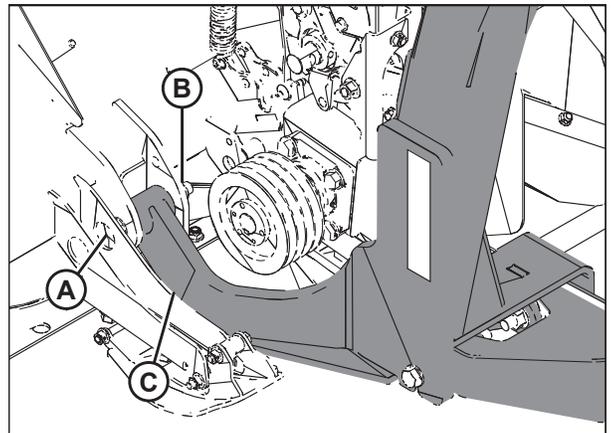


Figure 4.19: Frame – Left Side Shown

11. Install bolt (A) through frame (B) and bushing (D) in the lift arm. Repeat for the opposite side of the machine.
12. Check gaps (C) between the bushing inner steel sleeve (D) and frame (B). If there is a gap, install 1.2 mm thick flat washers (MD #5113) to minimize the gap on both sides of the bushing.
13. Remove bolt (A).

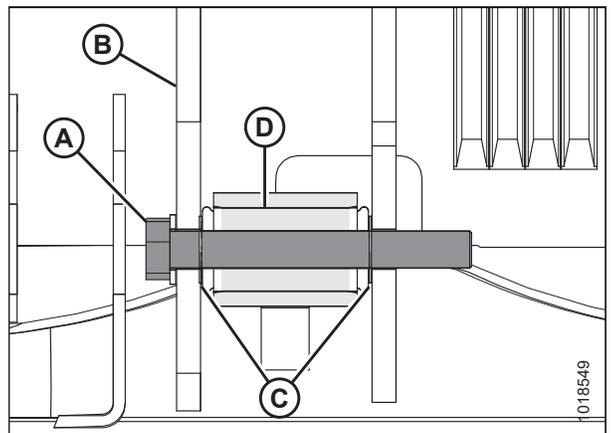


Figure 4.20: Frame Attachment – Left Side Shown

## CHANGING THE CONDITIONER

14. Install washer (A) onto bolt (B) and apply an anti-seize compound to the bolt shank only. Do **NOT** apply anti-seize to the threads.
15. Install bolt (B) with washers (C) as determined in Step 12, page 23.
16. Install three washers (D) and nut (E) onto bolt. Torque to 339 Nm (250 lbf-ft).
17. Repeat Step 12, page 23 to Step 16, page 24 for the opposite side.

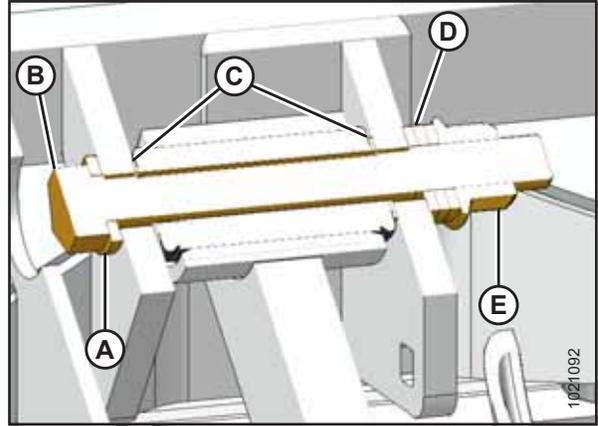


Figure 4.21: Frame Attachment – Cross Section View

18. With flat washer shim (A) on both sides of the center-link support, install securing bolt (B) and washer (C) through the conditioner center-link support bracket and center-link support.
19. Install nut (D) and torque to 339 Nm (250 lbf-ft).

### NOTE:

Some transparencies are used in the illustration to help clarify the position of shims (A).

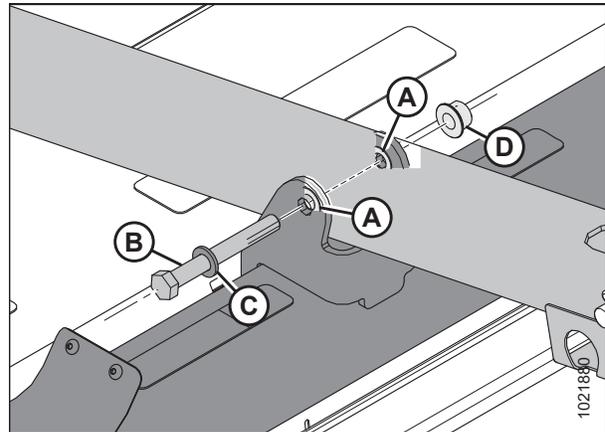


Figure 4.22: Center-Link Support

## WARNING

To prevent frame from slipping off forks, ensure frame is secured to forks. Failure to do so could result in death or serious injury.

20. Lift the header and remove wooden blocks (A) under the skid shoes. Lower the header to the ground.
21. Remove any straps or chains securing the frame to the forks, and back the forklift away from the work area.

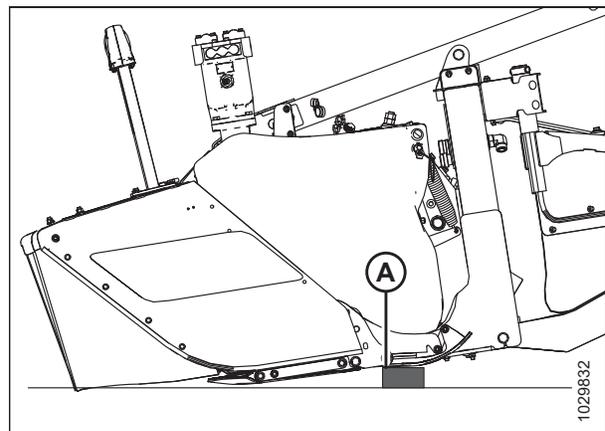


Figure 4.23: Header on Blocks

## CHANGING THE CONDITIONER

22. **M155 and M155E4 SP Windrowers:** Position the hose bundle and hose support (B) onto the adapter and secure with bolts (A) and nuts.

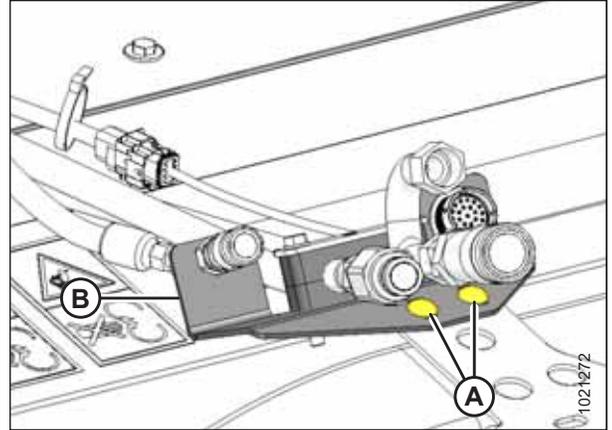


Figure 4.24: Hose Support

23. **M1 Series:** Reposition hose bundle (A) on the frame.
24. Install the conditioner drive belt. For instructions, refer to [4.3.2 Installing Conditioner Drive Belt, page 27](#).

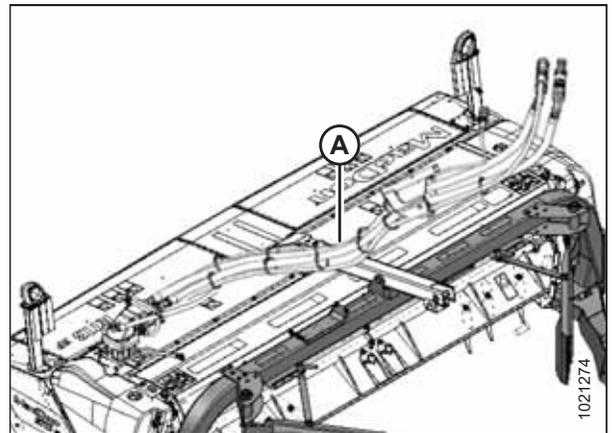


Figure 4.25: Hydraulic Hose Bundle

### 4.2.1 Installing Conditioner Drive

This procedure describes the installation of conditioner drive components on a machine that was originally supplied with no conditioner. If a conditioner is to be installed on the R113 Rotary Disc Header, refer to [4.2 Installing the Conditioner, page 21](#).

Retrieve bag containing the following parts from the conditioner shipment:

- Shaft key
- Pulley
- Bushing with three M10 bolts
- Tensioner assembly
- M16 hex head bolt
- M16 nut
- Two M10 nuts
- Eye bolt
- Hardened washer
- Spring

## CHANGING THE CONDITIONER

1. Remove drive cover (A) from left side of header by removing hex head bolt (B), flat washer (C), and nut (D), and sliding cover off pins (E).

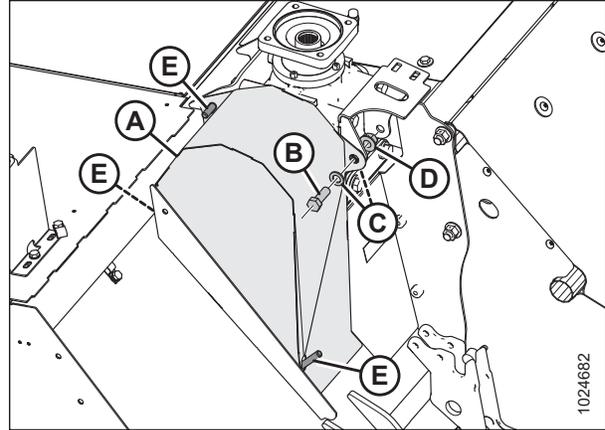


Figure 4.26: Drive Cover

2. Position tensioner assembly (A) as shown, and secure with M16 x 120 bolt (B) and nut (C). Torque nut (C) to 54 Nm (40 lbf-ft).

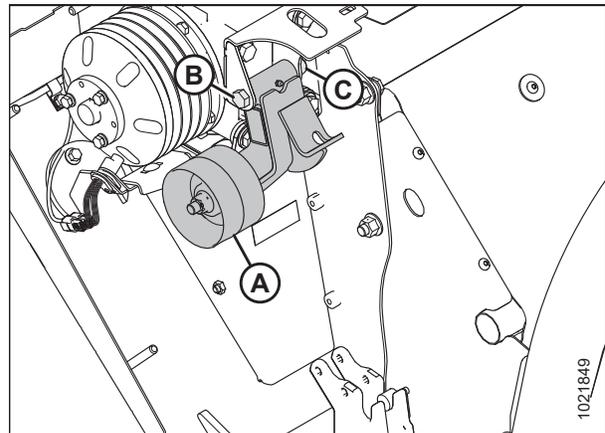


Figure 4.27: Tensioner

3. Install spring (A) into forward hole (B) in frame.
4. Install eyebolt (C) onto spring (A) and tensioner (D). Secure eyebolt (C) to tensioner (D) with hardened washer (E), and two M10 nuts (F), and straight pin (G).

**NOTE:**

Install conditioner drive belt after reattaching header to the adapter.

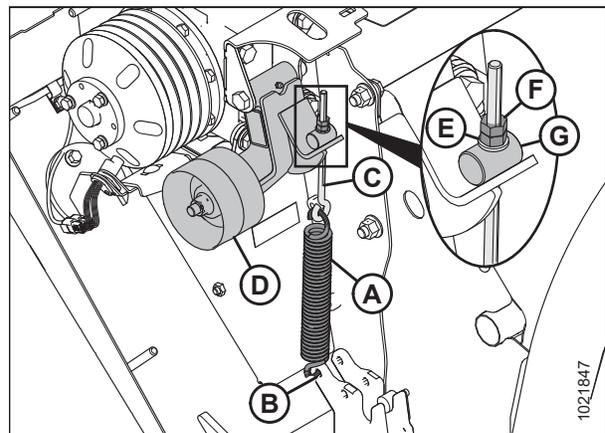


Figure 4.28: Tensioner

## 4.3 Conditioner Drive Belt

The conditioner drive belt is located inside the left driveshield and is tensioned with a spring tensioner. The tension is factory-set and should not require adjustment.

### 4.3.1 Removing Conditioner Drive Belt

#### WARNING

To avoid bodily injury or death from unexpected startup of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Lower the header fully.
2. Shut down the engine, and remove key from the ignition.
3. Open the left driveshield. For instructions, refer to [11.2 Opening Driveshields, page 98](#).
4. Disconnect wire harness (A) from speed sensor (B).

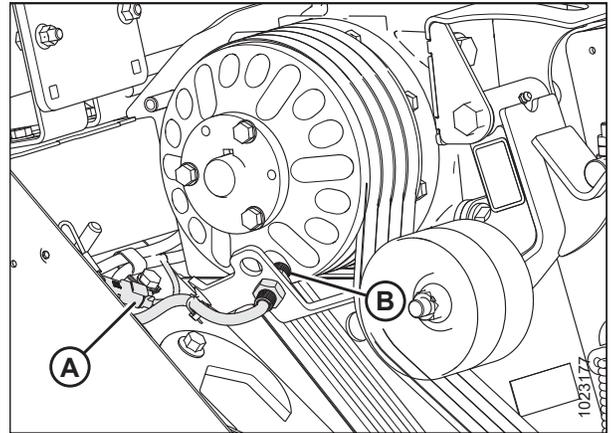


Figure 4.29: Speed Sensor Assembly

5. Turn jam nut (A) counterclockwise to unlock the tension adjustment.
6. Turn jam nut (A) and adjuster nut (B) counterclockwise to fully collapse tensioner spring (C), and release the tension from conditioner drive belt (D).
7. Remove drive belt (D).

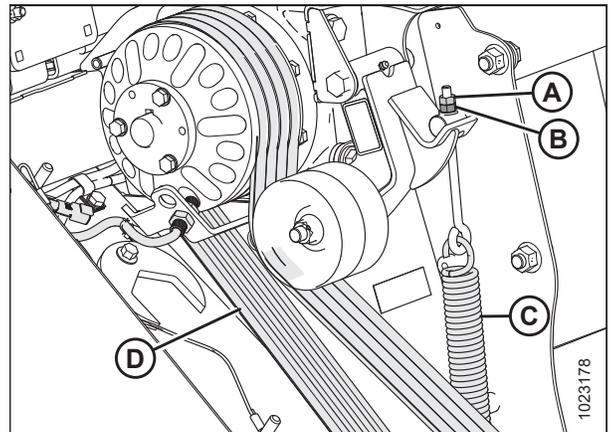


Figure 4.30: Conditioner Drive

### 4.3.2 Installing Conditioner Drive Belt

#### WARNING

To avoid bodily injury or death from unexpected startup of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

## CHANGING THE CONDITIONER

1. Lower the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Install drive belt (A) onto driven pulley (C) first, and then onto drive pulley (B), ensuring that the belt is in the pulley grooves.

**NOTE:**

If necessary, loosen the jam nut and adjuster nut to relieve the spring tension.

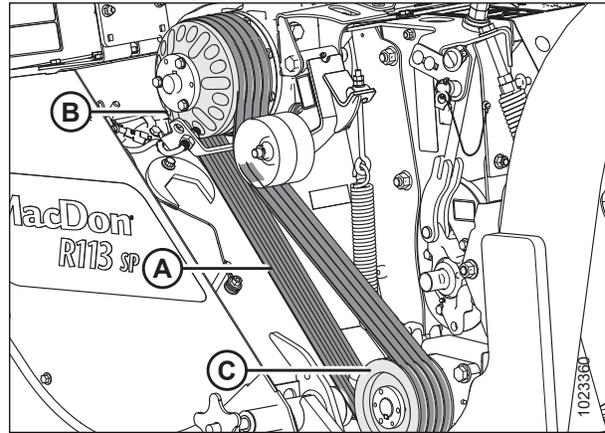


Figure 4.31: Conditioner Drive

4. Measure the length of tensioner spring (C); dimension (D) should be set to 365 mm (14 3/8 in.) for proper belt tension.
5. To adjust spring tension, loosen jam nut (A).
6. Turn adjuster nut (B) clockwise to increase spring/belt tension, or turn adjuster nut (B) counterclockwise to decrease spring/belt tension.
7. Once the correct spring measurement has been achieved, hold adjuster nut (B) and tighten jam nut (A) against it.

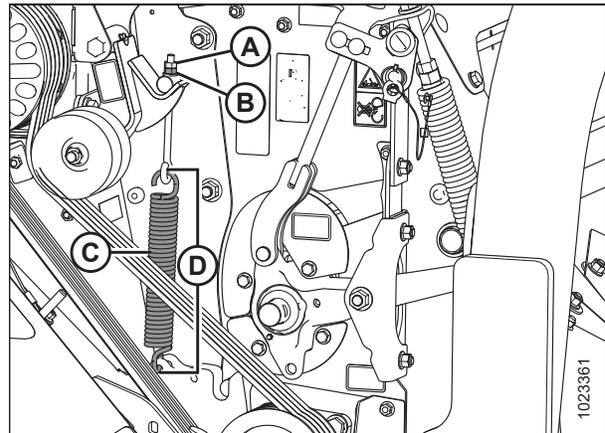


Figure 4.32: Conditioner Drive

8. Reconnect speed sensor (B) to wiring harness (A).

**NOTE:**

Ensure the speed sensor is installed correctly for the windrower: use the bottom hole for M1 Series Windrower; use the top hole for M155E4 SP Windrower.

9. Close the left driveshield. For instructions, refer to [11.3 Closing Driveshields, page 100](#).

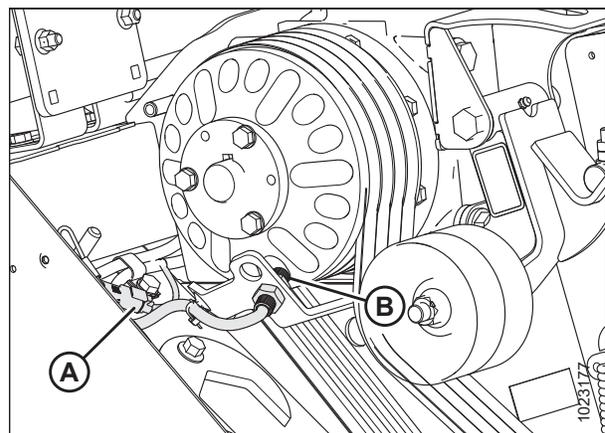


Figure 4.33: Speed Sensor

## 4.4 Discharge Shield – No Conditioner

- If a conditioner is being installed, the discharge shield needs to be removed. For instructions, refer to [4.4.1 Removing Discharge Shield – No Conditioner, page 29](#).
- If a conditioner is being removed, the discharge shield needs to be installed. For instructions, refer to [4.4.2 Installing Discharge Shield – No Conditioner, page 30](#).

### 4.4.1 Removing Discharge Shield – No Conditioner

Follow these steps to remove the shielding installed on a rotary disc header configured without a conditioner:

1. Disconnect and remove the header from the windrower. For instructions, refer to the header operator's manual.
2. On both ends of the header, remove four M16 hex head bolts (A), nuts, and flat washers that secure shield (B) to header panel (C).
3. Lift shield (A) until pins (B) (one on each side) disengage from the slots in support (C).

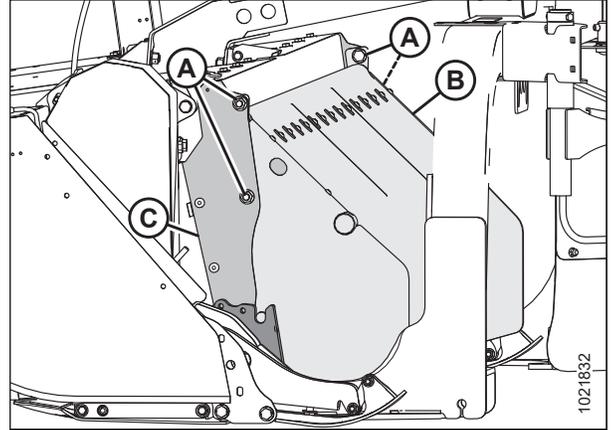


Figure 4.34: Left Side of Header – Right Opposite

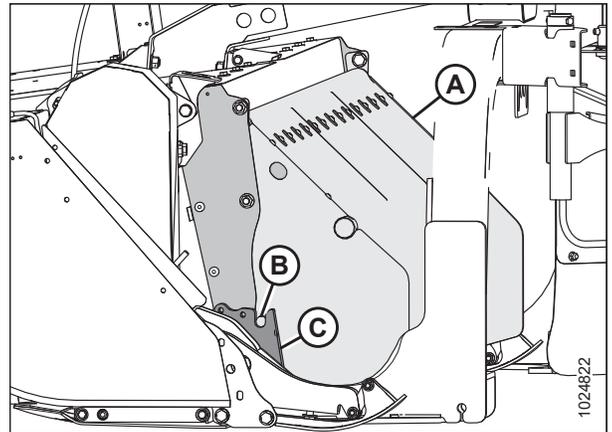


Figure 4.35: Left Side of Header – Right Opposite

### 4.4.2 Installing Discharge Shield – No Conditioner

Follow these steps to install the shielding on a rotary disc header configured without a conditioner:

1. Position shield (A) until pins (B) (one on each side) engage the slots in support (C) and the bolt holes in shield (A) align with holes (D) in the header.

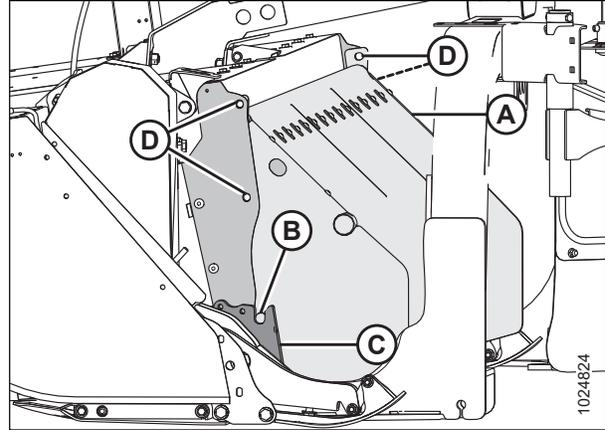


Figure 4.36: Left Side of Header – Right Opposite

2. Secure shield (B) to the header with four M16 hex head bolts (A), nuts, and flat washers.
3. Ensure the bolt heads face inboard and torque the nuts to 261 Nm (193 lbf·ft).

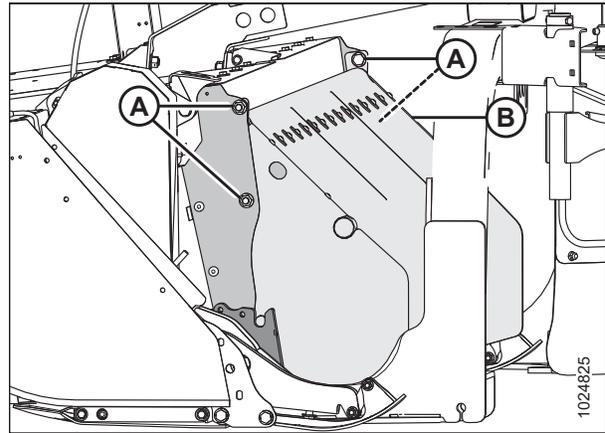


Figure 4.37: Left Side of Header – Right Opposite

# Chapter 5: Attaching Rotary Disc Header to Windrower

The procedure for attaching a rotary disc header to a windrower varies depending on the windrower model and how that windrower is equipped.

Proceed to the header attaching procedure that is suitable for your windrower:

- [5.1 Attaching R1 Series Rotary Disc Header to M1 Series Windrower, page 31](#)
- [5.2 Attaching R1 Series Rotary Disc Header to M155, M155E4, M205 Windrower – Hydraulic Center-Link with Optional Self-Alignment, page 37](#)
- [5.3 Attaching R1 Series Rotary Disc Header to M155, M155E4, M205 Windrower – Hydraulic Center-Link without Optional Self-Alignment, page 42](#)

## 5.1 Attaching R1 Series Rotary Disc Header to M1 Series Windrower

The windrower may have an optional self-aligning hydraulic center-link that allows vertical position control of the center-link from the cab.

### **WARNING**

To avoid bodily injury or death from unexpected startup of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Shut down the engine, and remove the key from the ignition.
2. **Hydraulic center-link without self-alignment:** Remove pin (A) and raise center-link (B) until the hook is above the attachment pin on the header. Replace pin (A) to hold center-link in place.

#### **IMPORTANT:**

If the center-link is too low, it may contact the header as the windrower approaches the header for hookup.

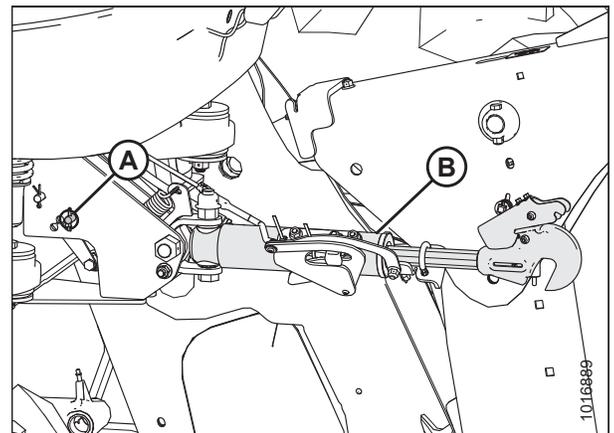


Figure 5.1: Hydraulic Center-Link

3. Remove hairpin (A) from clevis pin (B), and remove pin from header support (C) on both sides of the header.

### **WARNING**

Check to be sure all bystanders have cleared the area.

4. Start the windrower engine. For instructions, refer to the windrower operator's manual.

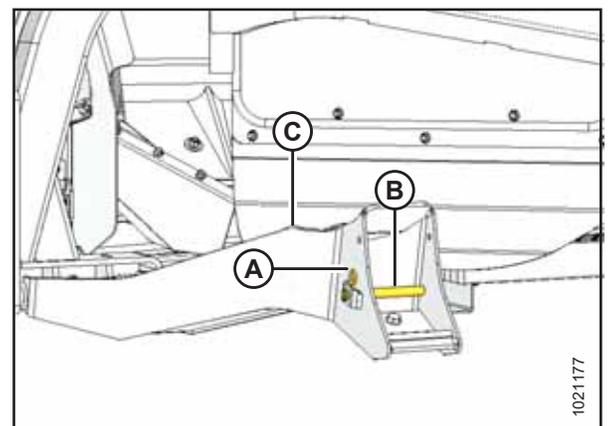


Figure 5.2: Header Support

## ATTACHING ROTARY DISC HEADER TO WINDROWER

5. If lowering the header lift legs **WITH** a header or weight box attached, proceed to Step 9, page 33.

If lowering the header lift legs **WITHOUT** a header or weight box attached, proceed to Step 6, page 32 to release tension from header float springs (A).

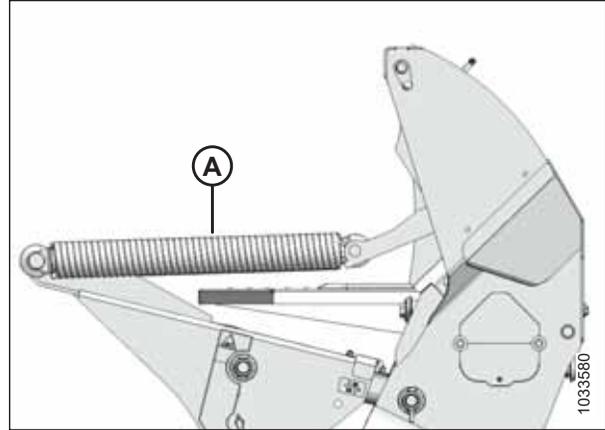


Figure 5.3: Header Float Springs

6. Press rotary scroll knob (A) on Harvest Performance Tracker (HPT) to highlight the QuickMenu options.
7. Rotate scroll knob (A) to highlight HEADER FLOAT symbol (B), and press the scroll knob to select. The Float Adjust page displays.



Figure 5.4: HPT Display

8. Press soft key 3 (A) to remove the header float.

### NOTE:

If the header float is active, the icon at soft key 3 will display Remove Float; if header float has been removed, the icon will display Resume Float.



Figure 5.5: HPT Display

## ATTACHING ROTARY DISC HEADER TO WINDROWER

9. Press HEADER DOWN switch (E) on the ground speed lever (GSL) to fully retract the header lift cylinders.
10. **Self-aligning hydraulic center-link:** Press REEL UP switch (B) on the GSL to raise the center-link until the hook is above the attachment pin on the header.

### IMPORTANT:

If the center-link is too low, it may contact the header as the windrower approaches the header for hookup.

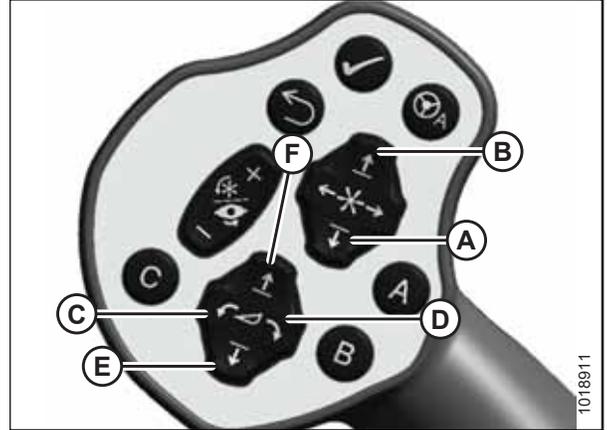


Figure 5.6: GSL

A - Reel Down	B - Reel Up
C - Header Tilt Down	D - Header Tilt Up
E - Header Down	F - Header Up

11. Drive the windrower slowly forward until feet (A) enter supports (B). Continue to drive slowly forward until the feet engage the supports and the header nudges forward.
12. Ensure feet (A) are properly engaged in supports (B).

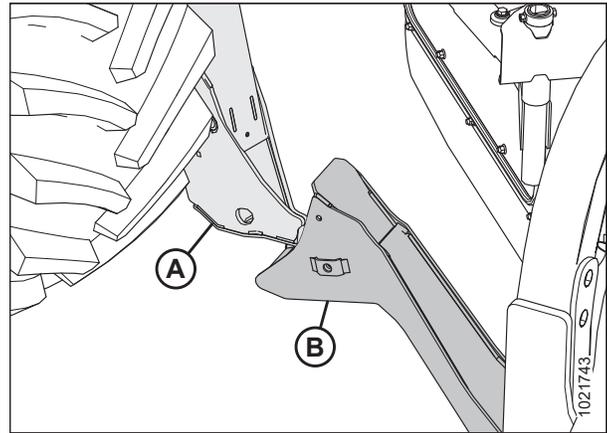


Figure 5.7: Header Support

### 13. Self-aligning hydraulic center-link:

- a. Adjust the position of center-link cylinder (A) with the switches on the GSL until hook (B) is above the header attachment pin.

### IMPORTANT:

Hook release (C) must be down to enable the self-locking mechanism.

- b. If hook release (C) is open (up), shut down the engine, and remove the key from the ignition. Manually push hook release (C) down after the hook engages the header pin.
- c. Lower center-link (A) onto the header with REEL DOWN switch on the GSL until the center-link locks into position and hook release (C) is down.
- d. Check that center-link is locked onto header by pressing the REEL UP switch on the GSL.

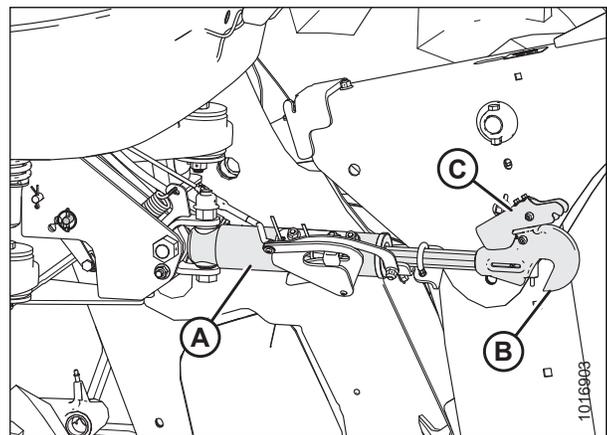


Figure 5.8: Hydraulic Center-Link

## ATTACHING ROTARY DISC HEADER TO WINDROWER

### 14. Hydraulic center-link without self-alignment:

- Press the HEADER TILT UP or HEADER TILT DOWN cylinder switches on the GSL to extend or retract the center-link cylinder until the hook is aligned with the header attachment pin.
- Shut down the engine, and remove the key from the ignition.
- Push down on rod end of link cylinder (B) until the hook engages and locks onto the header pin.

#### IMPORTANT:

The hook release must be down to enable self-locking mechanism. If the hook release is open (up), manually push it down after hook engages pin.

- Check that center-link (A) is locked onto the header by pulling upward on rod end (B) of cylinder.

### WARNING

Check to be sure all bystanders have cleared the area.

- Start the engine.

- Press HEADER UP switch (A) to raise the header to maximum height.

#### NOTE:

If one end of the header does **NOT** fully raise, rephase the lift cylinders as follows:

- Press and hold HEADER UP switch (A) until both cylinders stop moving.
- Continue to hold the switch for 3–4 seconds. Cylinders are now phased.

- Shut down the engine, and remove the key from the ignition.

- Engage the safety props on both lift cylinders as follows:

- Pull lever (A) toward you to release, and then rotate toward header to lower the safety prop onto the cylinder.
- Repeat for the opposite lift cylinder.

#### IMPORTANT:

Ensure the safety props engage over the cylinder piston rods. If the safety prop does **NOT** engage properly, raise the header until the safety prop fits over the rod.

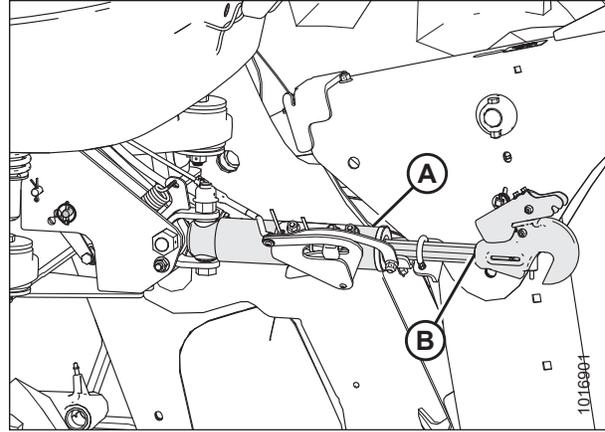


Figure 5.9: Hydraulic Center-Link



Figure 5.10: GSL

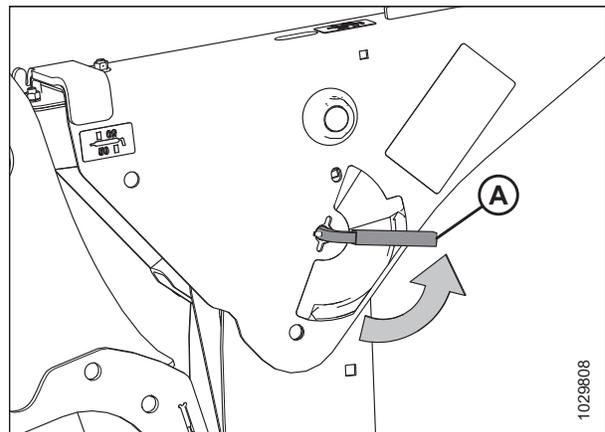


Figure 5.11: Safety Prop Lever

## ATTACHING ROTARY DISC HEADER TO WINDROWER

18. Install clevis pin (A) through the support and windrower lift arm and secure with hairpin (B). Repeat for the opposite side of the header.

**IMPORTANT:**

Ensure clevis pin (A) is fully inserted, and hairpin is installed behind bracket.

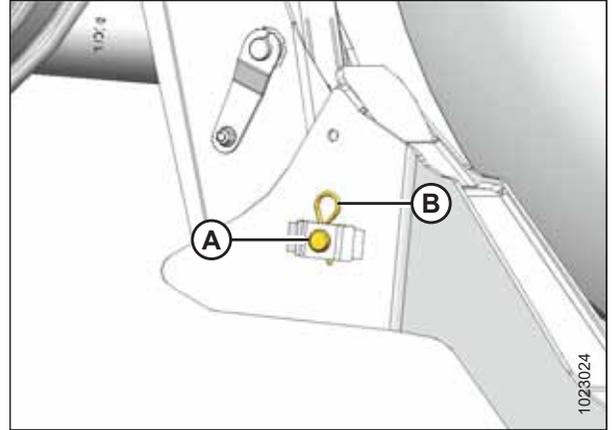


Figure 5.12: Header Support

19. Disengage the safety props on both lift cylinders as follows:
  - a. Turn lever (A) away from the header to raise the safety prop until the lever locks into the vertical position.
  - b. Repeat for the opposite cylinder.

**NOTE:**

If the safety prop will **NOT** disengage, raise the header to release the prop.

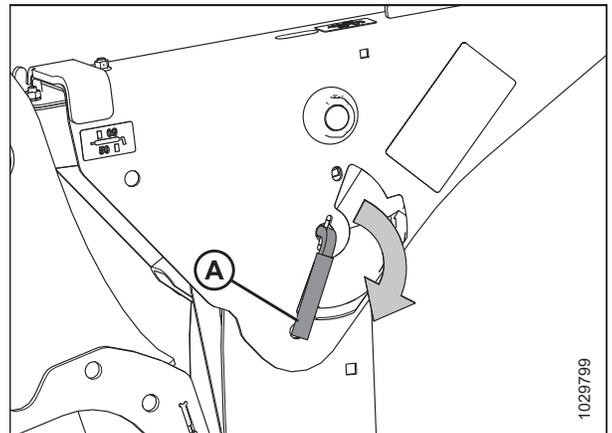


Figure 5.13: Safety Prop Lever

20. Start the engine and press HEADER DOWN switch (A) on GSL to fully lower header.
21. Shut down the engine, and remove the key from the ignition.

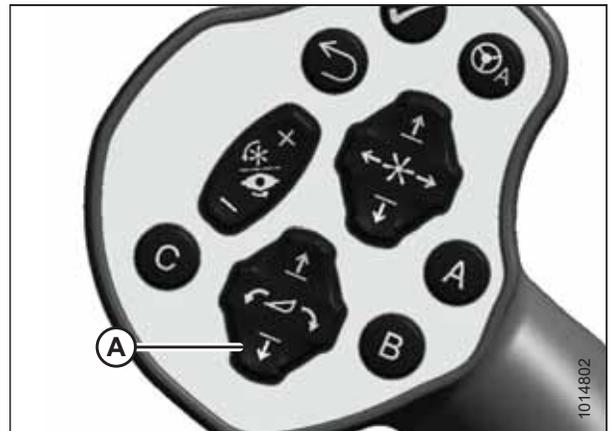


Figure 5.14: GSL

## ATTACHING ROTARY DISC HEADER TO WINDROWER

22. If not prompted by the HPT display to restore header float, restore header float manually by doing the following:
  - a. Press rotary scroll knob (A) on Harvest Performance Tracker (HPT) to highlight QuickMenu options.
  - b. Rotate scroll knob (A) to highlight Header Float icon (B), and press the scroll knob to select. The screen changes.



Figure 5.15: HPT Display

23. Press soft key 3 (A) to restore the header float.

**NOTE:**

If the header float is active, the icon at soft key 3 will display Remove Float; if header float has been removed, the icon will display Resume Float.

24. Shut down the engine, and remove the key from the ignition.



Figure 5.16: HPT Display

## 5.2 Attaching R1 Series Rotary Disc Header to M155, M155E4, M205 Windrower – Hydraulic Center-Link with Optional Self-Alignment

### WARNING

To avoid bodily injury or death from unexpected startup of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Shut down the engine, and remove the key from the ignition.
2. Remove hairpin (B) from clevis pin (A) and remove the clevis pin from header support (C) on both sides of the header.

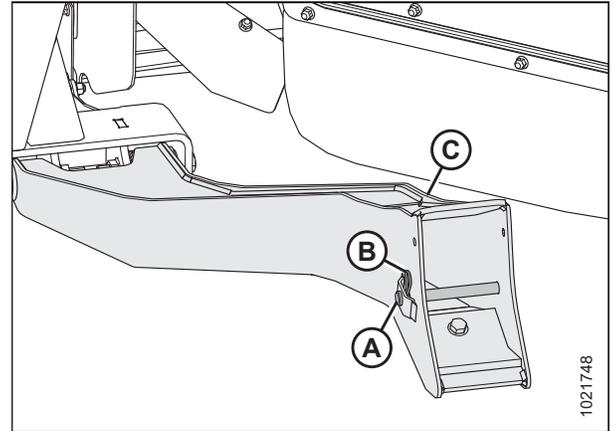


Figure 5.17: Header Support

3. Remove the float engagement pin from hole (A) to disengage the float springs, and insert the float engagement pin into storage hole (B). Secure with the lynch pin. Repeat for the opposite linkage.

#### IMPORTANT:

To prevent damage to the lift system when lowering the header lift linkages without a header or weight box attached to the windrower, ensure the float engagement pin is installed in storage hole (B) and **NOT** in engaged position (A).

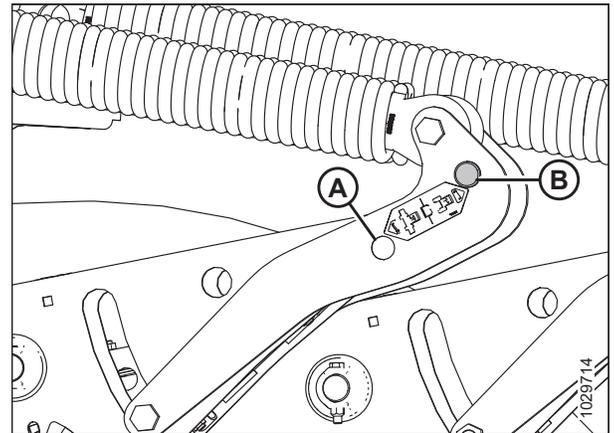


Figure 5.18: Float Linkage

## ATTACHING ROTARY DISC HEADER TO WINDROWER

### WARNING

Check to be sure all bystanders have cleared the area.

4. Start the engine and activate HEADER DOWN button (A) on the ground speed lever (GSL) to fully retract the header lift cylinders.

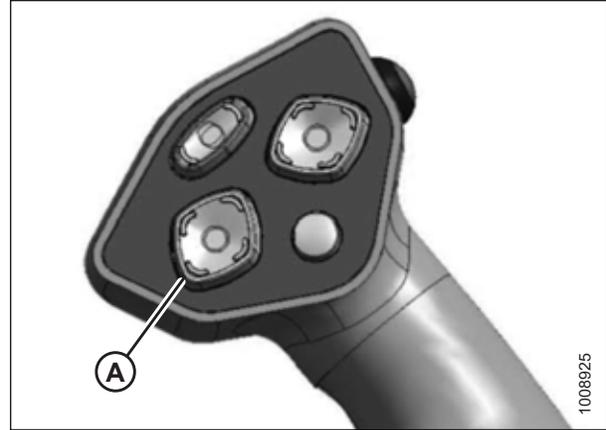


Figure 5.19: Ground Speed Lever

5. Press REEL UP switch (A) on the GSL to raise the center-link until the hook is above the attachment pin on the header.

#### IMPORTANT:

If the center-link is too low, it may contact the header as the windrower approaches the header for hookup.



Figure 5.20: Ground Speed Lever

6. Slowly drive the windrower forward until windrower feet (A) enter header supports (B). Continue driving slowly forward until the feet engage the supports and the header nudges forward.

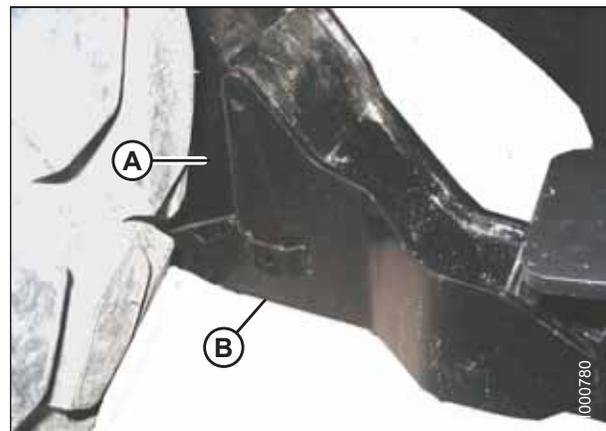


Figure 5.21: Header Support

## ATTACHING ROTARY DISC HEADER TO WINDROWER

7. Use the following GSL functions to position the center-link hook above the header attachment pin:
  - REEL UP (A) to raise the center-link
  - REEL DOWN (B) to lower the center-link
  - HEADER TILT UP (C) to retract the center-link
  - HEADER TILT DOWN (D) to extend the center-link

### IMPORTANT:

The hook release must be down to enable the self-locking mechanism. If the release is open (up), manually push it down after hook engages header pin.

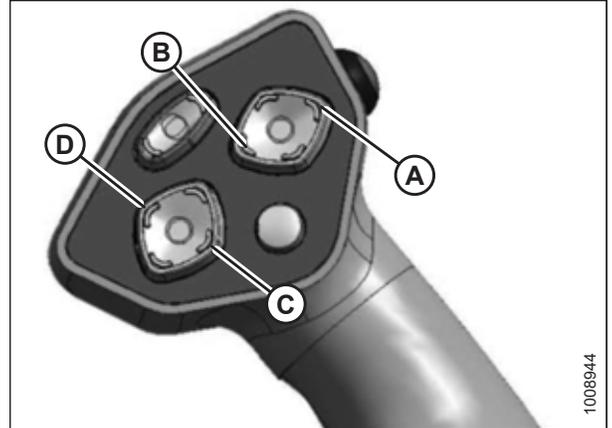


Figure 5.22: Ground Speed Lever

8. Adjust center-link cylinder (A) position with the REEL UP and REEL DOWN switches on the GSL until the hook is positioned above the header attachment pin.

### IMPORTANT:

Hook release (B) must be down to enable the self-locking mechanism. If the release is open (up), manually push it down after hook engages header pin.

9. Lower center-link (A) onto the header with the REEL DOWN switch until the center-link locks into position and hook release (B) is down.
10. Check that center-link is locked onto the header by pressing the REEL UP switch on the GSL.

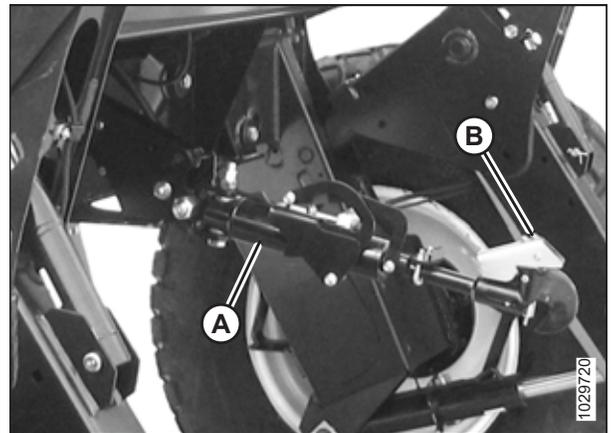


Figure 5.23: Hydraulic Center-Link



## WARNING

Check to be sure all bystanders have cleared the area.

11. Press HEADER UP switch (A) to raise the header to maximum height.
12. If one end of the header does **NOT** fully raise, rephase the lift cylinders as follows:
  - a. Press and hold the HEADER UP switch until both cylinders stop moving.
  - b. Continue to hold the switch for 3–4 seconds. Cylinders are now phased.

### NOTE:

It may be necessary to repeat this procedure if there is air in the system.



Figure 5.24: Ground Speed Lever

## ATTACHING ROTARY DISC HEADER TO WINDROWER

13. Engage the safety props on both lift cylinders as follows:
  - a. Shut down the engine, and remove the key from the ignition.
  - b. Pull lever (A) and rotate it towards the header to release and lower safety prop (B) onto the lift cylinder.
  - c. Repeat for the opposite lift cylinder.

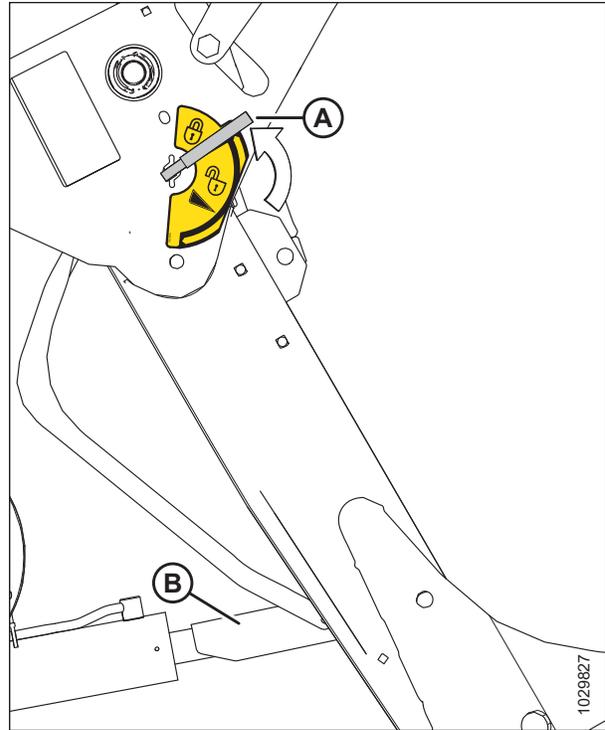


Figure 5.25: Safety Prop

14. Install clevis pin (A) through the support and windrower lift member, and secure with hairpin (B). Repeat for the opposite side of the machine.

**IMPORTANT:**

Ensure clevis pin (A) is fully inserted and the hairpin is installed behind bracket.

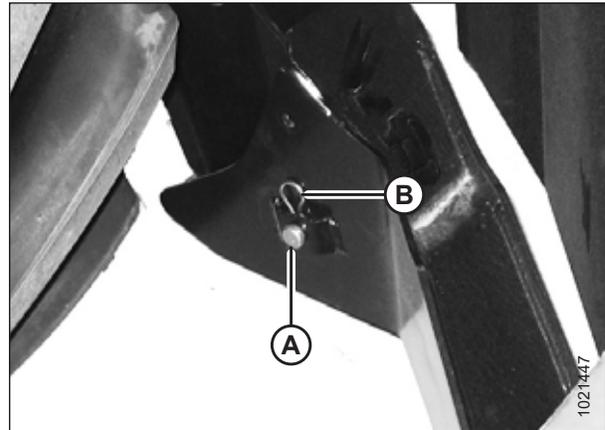


Figure 5.26: Header Support

## ATTACHING ROTARY DISC HEADER TO WINDROWER

15. Remove the clevis pin from storage position (B) in the linkage and insert into hole (A) to engage the float springs. Secure with the hairpin.

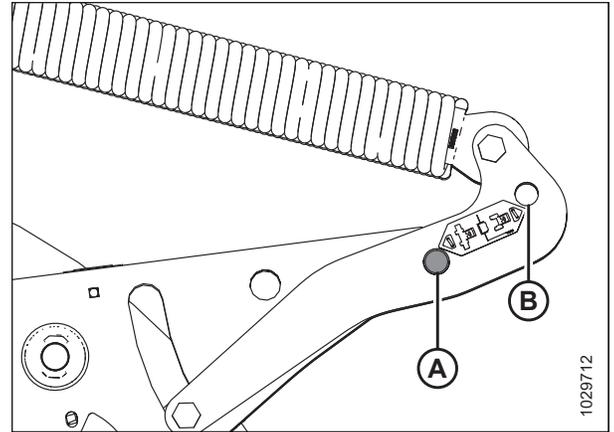


Figure 5.27: Header Float Linkage

16. Disengage the safety prop by turning lever (A) downwards until the lever locks into vertical position.
17. Repeat for the opposite safety prop.

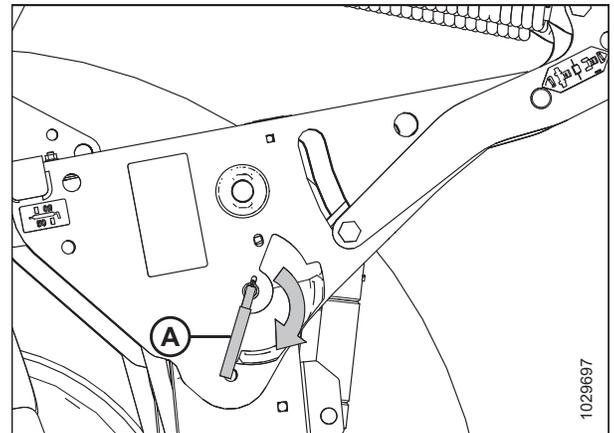


Figure 5.28: Safety Prop Lever



### WARNING

Check to be sure all bystanders have cleared the area.

18. Start the engine, and press HEADER DOWN switch (A) on the GSL to fully lower the header.
19. Stop the engine, and remove the key from the ignition.



Figure 5.29: Ground Speed Lever

### 5.3 Attaching R1 Series Rotary Disc Header to M155, M155E4, M205 Windrower – Hydraulic Center-Link without Optional Self-Alignment

#### WARNING

To avoid bodily injury or death from unexpected startup of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Shut down the engine, and remove the key from the ignition.
2. Remove hairpin (B) from clevis pin (A), and then remove the clevis pin from header support (C) on both sides of the header.

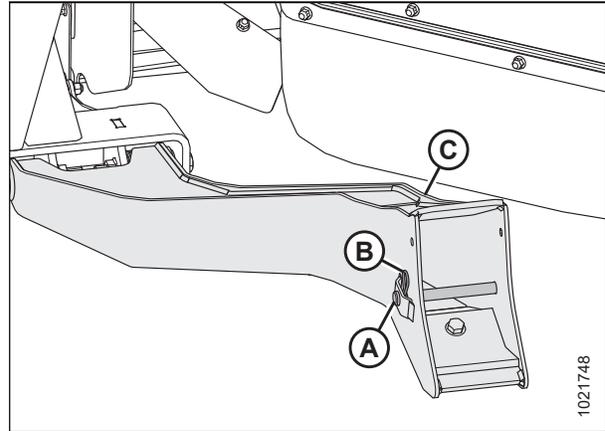


Figure 5.30: Header Support

3. To disengage the float springs, move the float engagement pin from engaged position (A) and insert the pin into storage hole (B). Secure the float engagement pin with a lynch pin. Repeat for opposite linkage.

#### IMPORTANT:

To avoid damaging the lift system when lowering the header lift linkages without a header or weight box attached, ensure the float engagement pin is installed in storage position (B) and **NOT** in engaged position (A).

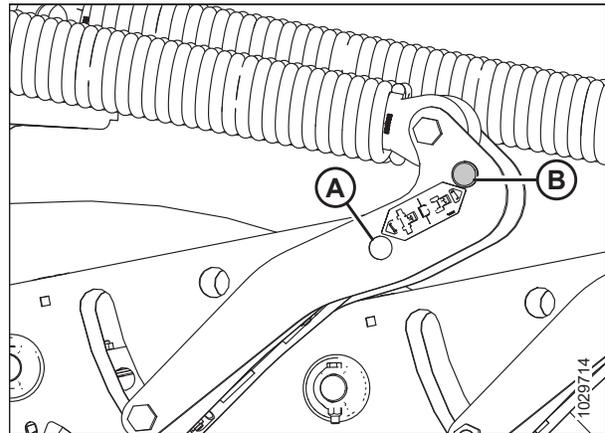


Figure 5.31: Header Float Linkage

## ATTACHING ROTARY DISC HEADER TO WINDROWER

### **WARNING**

Check to be sure all bystanders have cleared the area.

4. Start the engine and activate HEADER DOWN button (A) on the ground speed lever (GSL) to fully retract the header lift cylinders.

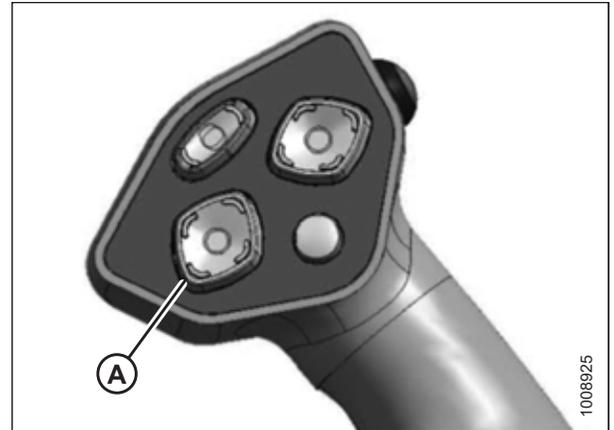


Figure 5.32: Ground Speed Lever

5. Remove pin (A) from the frame linkage and raise center-link (B) until the hook is above the attachment pin on the header. Replace pin (A) to hold the center-link in place.

#### **IMPORTANT:**

If the center-link is too low, it may contact the header as the windrower approaches the header for hookup.

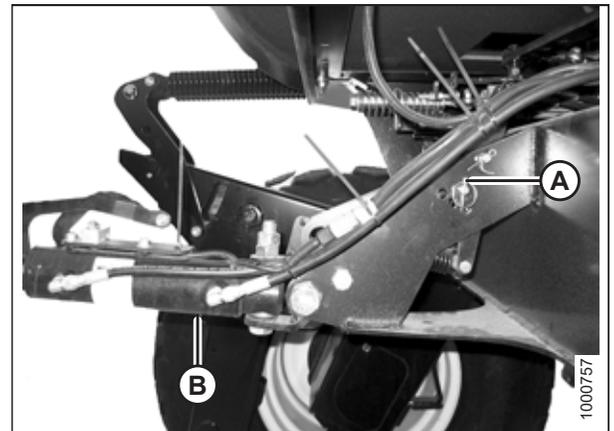


Figure 5.33: Hydraulic Center-Link

6. Slowly drive the windrower forward until windrower feet (A) enter header supports (B). Continue driving slowly forward until the feet engage the supports and the header nudges forward.

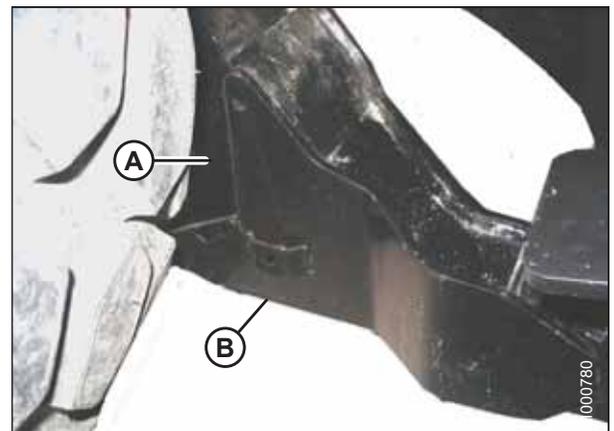


Figure 5.34: Header Support

## ATTACHING ROTARY DISC HEADER TO WINDROWER

7. Use the following GSL functions to position the center-link hook above the header attachment pin:
  - HEADER TILT UP (A) to retract the center-link
  - HEADER TILT DOWN (B) to extend the center-link
8. Stop the engine, and remove the key from the ignition.

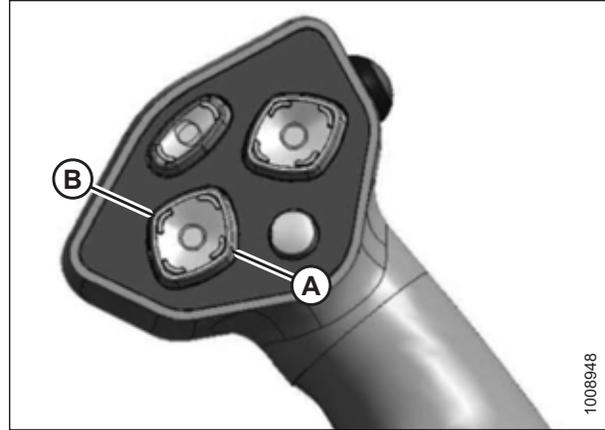


Figure 5.35: Ground Speed Lever

9. Push down on the rod end of link cylinder (A) until hook (B) engages and locks onto the header pin.

### IMPORTANT:

The hook release must be down to enable the self-locking mechanism. If the release is open (up), manually push it down after the hook engages the header pin.

10. Check that center-link (A) is locked onto the header by pulling upward on the rod end of the cylinder.

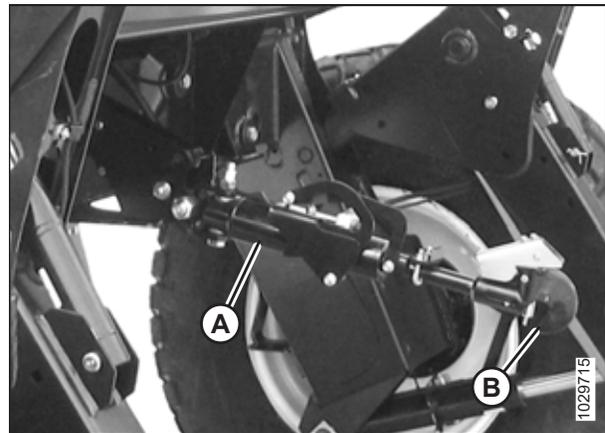


Figure 5.36: Hydraulic Center-Link

## WARNING

Check to be sure all bystanders have cleared the area.

11. Start the engine.
12. Press HEADER UP switch (A) to raise the header to maximum height.
13. If one end of the header does **NOT** fully raise, rephase the lift cylinders as follows:
  - a. Press and hold the HEADER UP switch until both cylinders stop moving.
  - b. Continue to hold the switch for 3–4 seconds. Cylinders are now phased.

### NOTE:

It may be necessary to repeat this procedure if there is air in the system.



Figure 5.37: Ground Speed Lever

## ATTACHING ROTARY DISC HEADER TO WINDROWER

14. Engage the safety props on both lift cylinders as follows:
  - a. Shut down the engine, and remove the key from the ignition.
  - b. Pull lever (A) and rotate it towards the header to release and lower safety prop (B) onto the lift cylinder.
  - c. Repeat for the opposite lift cylinder.

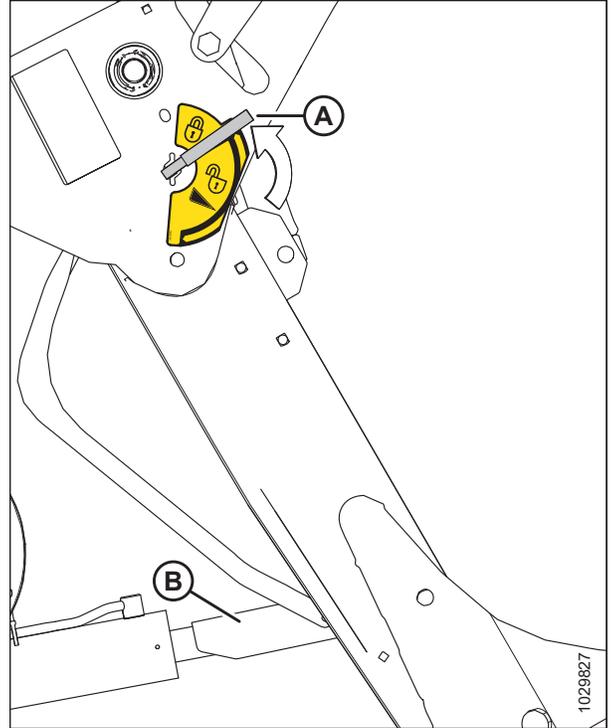


Figure 5.38: Safety Prop

15. Install clevis pin (A) through the support and windrower lift member, and secure with hairpin (B). Repeat for the opposite side of the machine.

**IMPORTANT:**

Ensure clevis pin (A) is fully inserted and the hairpin is installed behind the bracket.

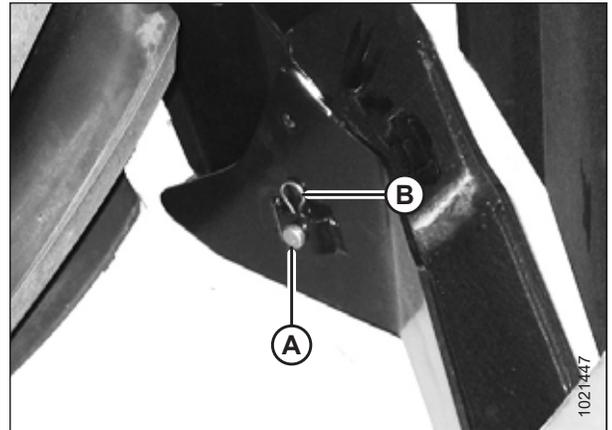


Figure 5.39: Header Support

## ATTACHING ROTARY DISC HEADER TO WINDROWER

16. Remove the clevis pin from storage position (B) in the linkage and insert into hole (A) to engage the float springs. Secure with the hairpin.

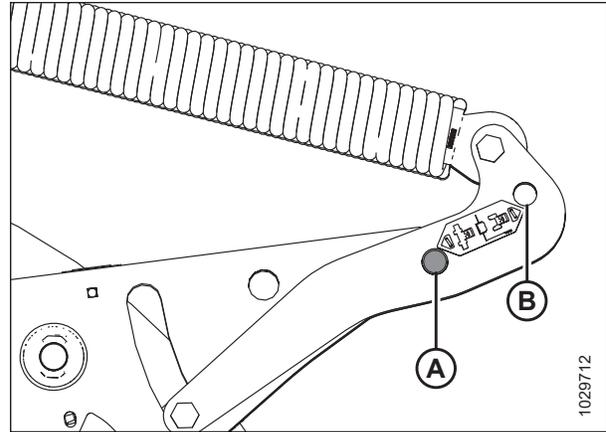


Figure 5.40: Header Float Linkage

17. Disengage the safety prop by turning lever (A) downwards until the lever locks into vertical position.
18. Repeat for the opposite safety prop.

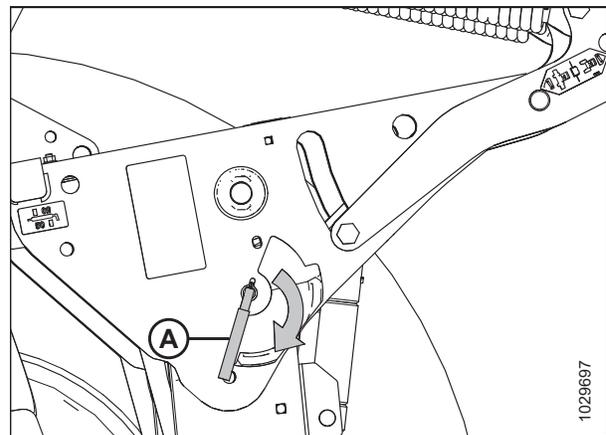


Figure 5.41: Safety Prop Lever

### **WARNING**

Check to be sure all bystanders have cleared the area.

19. Start the engine, and press HEADER DOWN switch (A) on the GSL to fully lower the header.
20. Stop the engine, and remove the key from the ignition.

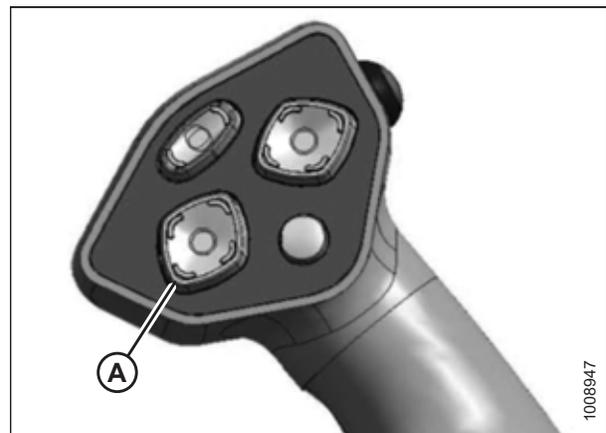


Figure 5.42: Ground Speed Lever

## Chapter 6: Attaching Hydraulic and Electrical Components

The procedure for attaching the header hydraulic and electrical components changes depending on the windrower model.

### NOTE:

Hydraulic conversion kits are available (motors, hoses, etc.) to convert a factory configured header from M1 to M series application and vice versa. If required, order Header Drive Conversion Kit.

Refer to the hydraulic and electrical attachment procedure that is appropriate for the windrower model:

- [6.1 Connecting R113 Rotary Disc Header Hydraulics and Electrical to M1240 Windrower, page 47](#)
- [6.2 Connecting R1 Series Rotary Disc Header Hydraulics and Electrical to M1170 Windrowers, page 52](#)
- [6.3 Connecting R1 Series Rotary Disc Hydraulic and Electrical to M155 or M155E4 Windrowers, page 57](#)

### 6.1 Connecting R113 Rotary Disc Header Hydraulics and Electrical to M1240 Windrower

#### IMPORTANT:

Before connecting the hydraulics from an R113 Rotary Disc Header to an M1240 Windrower, first install the M1240 Low Pressure Case Drain kit (MD #B6698) by following the instructions provided in the kit.

The R1 Series Rotary Disc Header hydraulics connection procedure varies depending on the windrower configuration:

- Draper header ready windrowers include one set of hydraulic quick couplers which are compatible with the header drive hoses on the R113 Rotary Disc Header.
- Rotary disc header ready windrowers include hard plumbed hydraulics connections.

#### IMPORTANT:

To prevent contamination of the hydraulic system, use a clean rag to remove dirt and moisture from all (fixed and movable) hydraulic couplers.

#### NOTE:

The R113 Rotary Disc Header hydraulic bundle includes a complete set of quick couplers that can be installed onto a rotary disc header configured windrower.

1. Open the windrower's left platform. For instructions, refer to windrower operator's manual.
2. Using a clean rag, remove dirt and moisture from the couplers on the left side of the windrower frame.
3. Retrieve hydraulic hoses (A) from the header and route the hose bundle under the windrower frame.
4. Insert pin (B) into hole (C) in windrower frame.

#### IMPORTANT:

Route hydraulic hoses as straight as possible, and avoid rub/wear points that could damage the hoses. To prevent damage, hoses should have enough slack to pass by the multicoupler bracket without contact. To adjust hose slack, loosen hose holder (B) on the front windrower leg, adjust hoses, then retighten the hose holder.

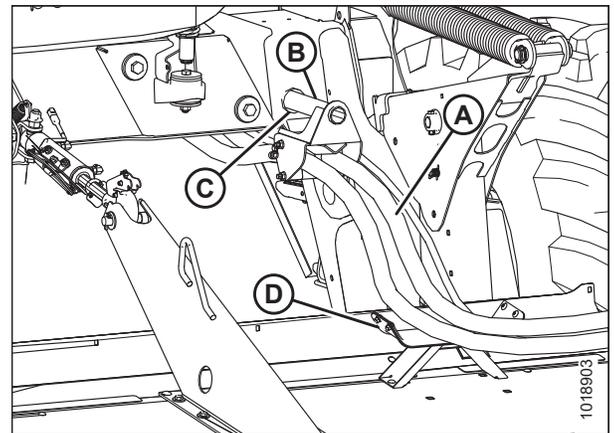


Figure 6.1: Hose Support Attachment

## ATTACHING HYDRAULIC AND ELECTRICAL COMPONENTS

Proceed with the steps that are relevant to the following windrower configurations:

Windrower Configuration	Steps for Connecting Hydraulics and Electrical
Rotary disc/drapper ready configuration (A)	Steps 5, page 48 to 7, page 49
Rotary disc only hard plumbed configuration (B)	Steps 8, page 49 to 9, page 50
Rotary disc ready configuration (B) with quick couplers installed	Steps 10, page 50 to 14, page 51

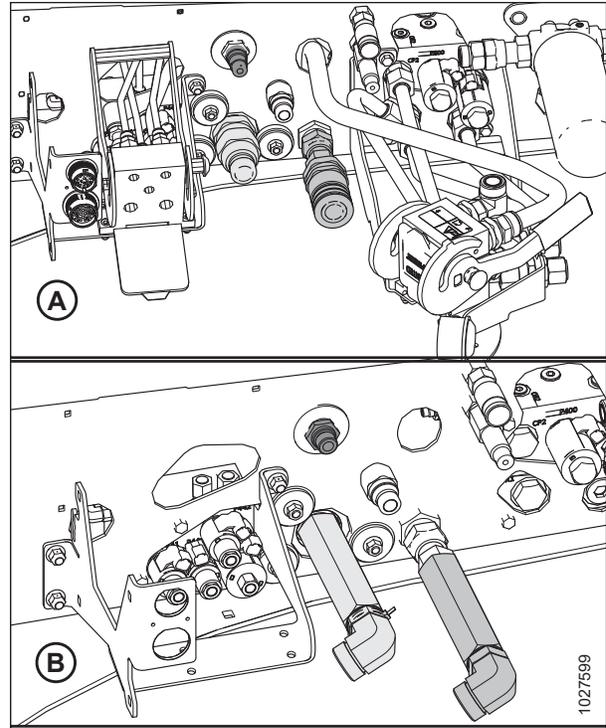


Figure 6.2: Header Hydraulics Configurations

### Rotary disc/drapper ready configuration with quick couplers:

5. Ensure hose (A) is disconnected from windrower receptacle (B) and placed in storage cup (C) on multicoupler.

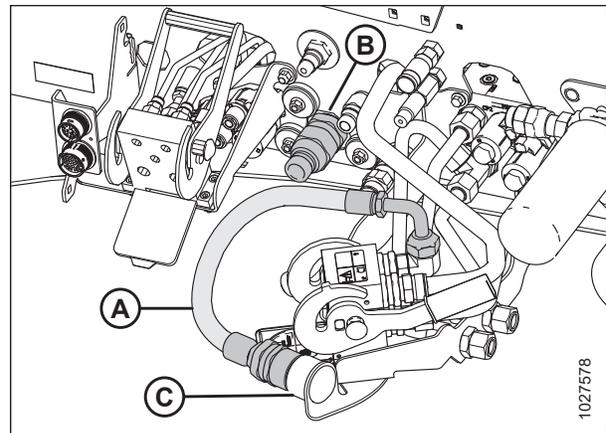


Figure 6.3: Couplers – Draper Ready

## ATTACHING HYDRAULIC AND ELECTRICAL COMPONENTS

6. Remove the extra hydraulic quick couplers from pressure hose (A) and return hose (B) and store them as spares.

**NOTE:**

It is normal to have an extra set of quick couplers with the rotary disc/drapper ready configuration.

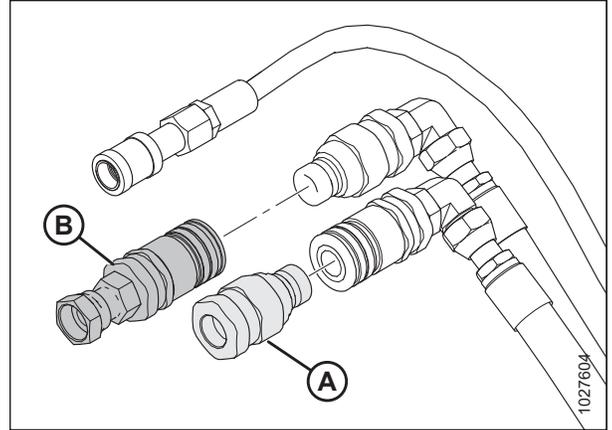


Figure 6.4: Hydraulic Quick Couplers

7. Connect the hydraulic hoses to the windrower with quick coupler fittings as follows:
  - a. Connect pressure hose female coupler to receptacle (A).
  - b. Connect return hose male coupler to receptacle (B).
  - c. Connect case drain hose (C) to mating 1/2 in. coupler on frame—installed with the M1240 Low Pressure Case Drain kit (MD #B6698). The other 1/2 in. flat faced coupler for case drain (E) is **NOT** suitable for the R113 Rotary Disc Header.
  - d. Connect the electrical harness to receptacle (D).

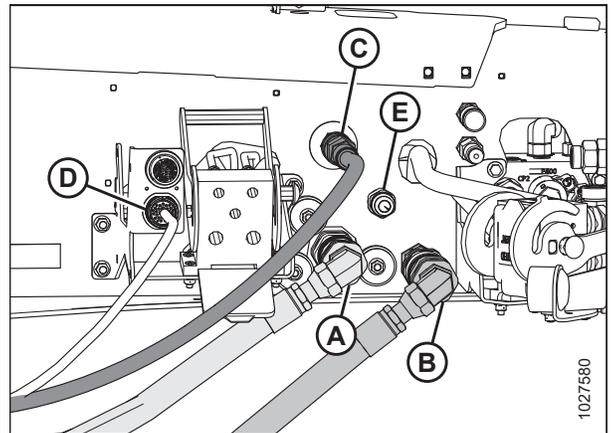


Figure 6.5: Hydraulics and Electrical – Draper Ready Windrower

**Hard plumbed fittings – rotary disc ready windrower:**

8. If installed, remove the existing quick couplers and elbow fittings from header hydraulic pressure hose (A) and return hose (B). Do **NOT** remove fittings from case drain hose (C).

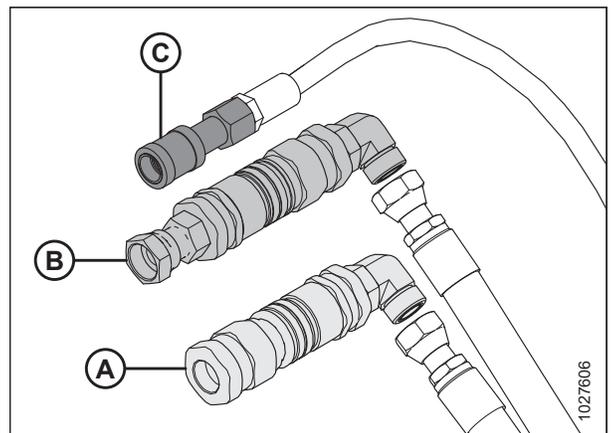


Figure 6.6: R113 SP Hose Bundle – Rotary Disc Ready Windrower

## ATTACHING HYDRAULIC AND ELECTRICAL COMPONENTS

9. Connect the hydraulic hoses to the windrower with hard plumbed fittings as follows:
  - a. Connect rotary disc pressure hose (A) to fitting on frame and torque to 205–226 Nm (151–167 lbf-ft).
  - b. Connect rotary disc return hose (B) to fitting on frame and torque to 205–226 Nm (151–167 lbf-ft).
  - c. Connect case drain hose (C) to mating 1/2 in. coupler on frame—installed with the M1240 Low Pressure Case Drain kit (MD #B6698). The other 1/2 in. flat faced coupler for case drain (E) is **NOT** suitable for the R113 Rotary Disc Header.
  - d. Connect the electrical harness to receptacle (D).

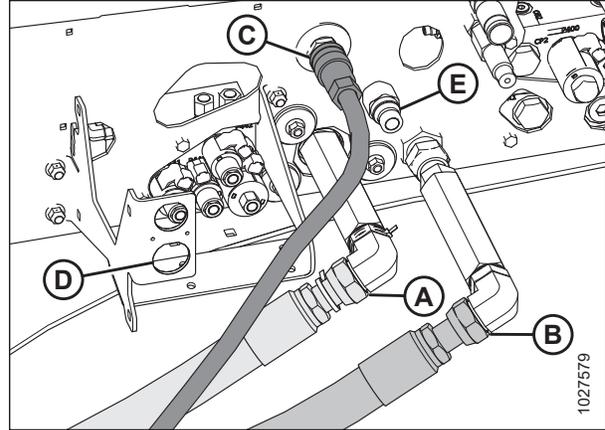


Figure 6.7: Hard Plumbed Connections on Disc Header Ready Windrower

### Quick coupler fittings – rotary disc ready windrower:

10. Remove quick couplers from pressure hose (A) and return hose (B) on the R113 Rotary Disc Header hydraulic hose bundle.

#### NOTE:

Do **NOT** remove the fittings on the case drain hose that was installed with the M1240 Low Pressure Case Drain kit (MD #B6698).

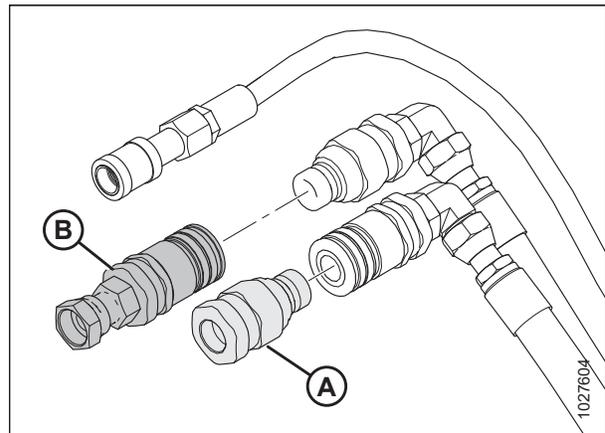


Figure 6.8: Hydraulic Quick Couplers

11. Remove the extension fittings and elbows (A) from the rotary disc header hydraulic pressure and return connections.

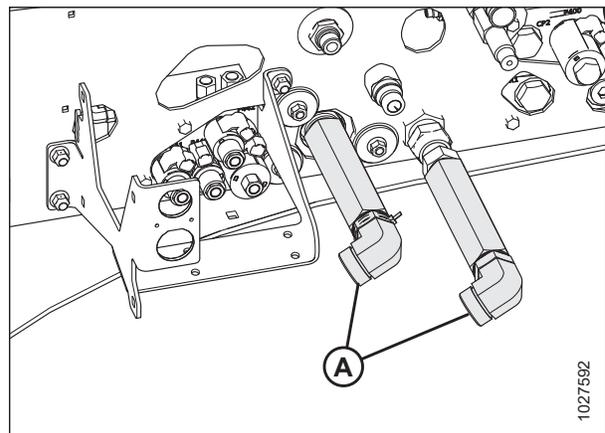


Figure 6.9: Hard Plumbed Connections – Rotary Disc Ready Windrower

## ATTACHING HYDRAULIC AND ELECTRICAL COMPONENTS

12. Install the male quick coupler at windrower pressure receptacle (A).
13. Install the female quick coupler with adapter at windrower return receptacle (B).

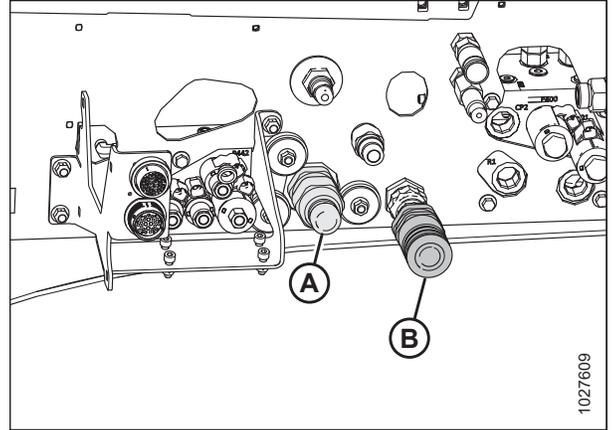


Figure 6.10: Quick Couplers on Rotary Disc Ready Windrower

14. Connect the hydraulic hoses to the windrower with quick connect fittings, as follows:
  - a. Connect pressure hose (A) female coupler to receptacle.
  - b. Connect return hose (B) male coupler to receptacle.
  - c. Connect case drain hose (C) to mating 1/2 in. coupler on frame—installed with the M1240 Low Pressure Case Drain kit (MD #B6698). The other 1/2 in. flat faced coupler for case drain (E) is **NOT** suitable for the R113 Rotary Disc Header.
  - d. Connect the electrical harness to receptacle (D).

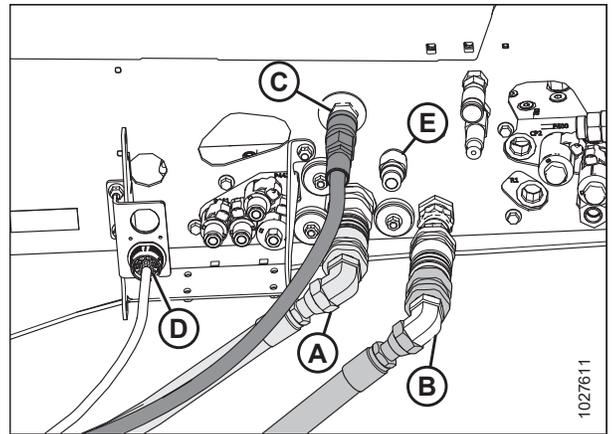


Figure 6.11: Quick Couplers on Rotary Disc Ready Windrower

15. Push latch (B) to unlock and close left side platform (A).
16. Calibrate the knife pump on the windrower. For instructions, refer to [6.2.1 Calibrating M1 Series Windrower Knife Drive and Header on the Harvest Performance Tracker Display, page 55](#).

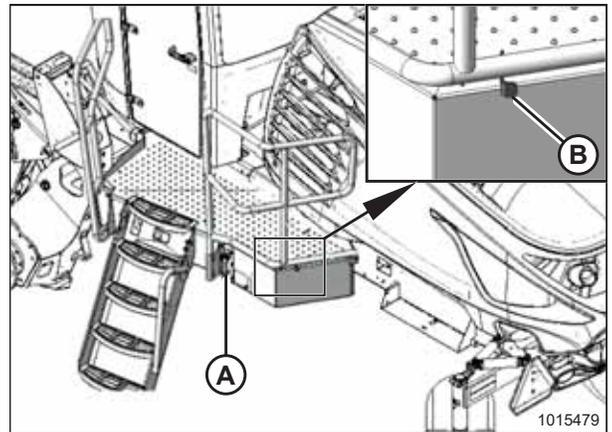


Figure 6.12: Left Cab-Forward Platform

## 6.2 Connecting R1 Series Rotary Disc Header Hydraulics and Electrical to M1170 Windrowers

**IMPORTANT:**

To prevent contamination of the hydraulic system, use a clean rag to remove dirt and moisture from all (fixed and movable) hydraulic couplers.

1. Open the platform.
2. Retrieve the hydraulic hoses from the header.
3. Attach hose support (A) to the frame near the windrower left cab-forward leg, and route the hoses under the frame.

**NOTE:**

Route the hydraulic hoses as straight as possible, and avoid rub/wear points that could cause damage.

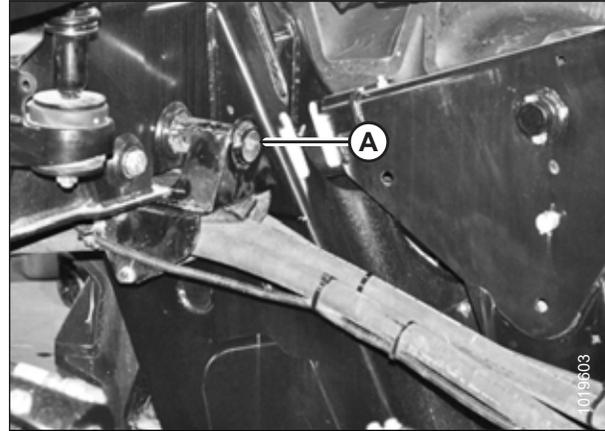


Figure 6.13: Hose Support Attachment

4. Disconnect male coupler (A) from pressure hose.
5. Disconnect female coupler and fitting (B) from return hose.

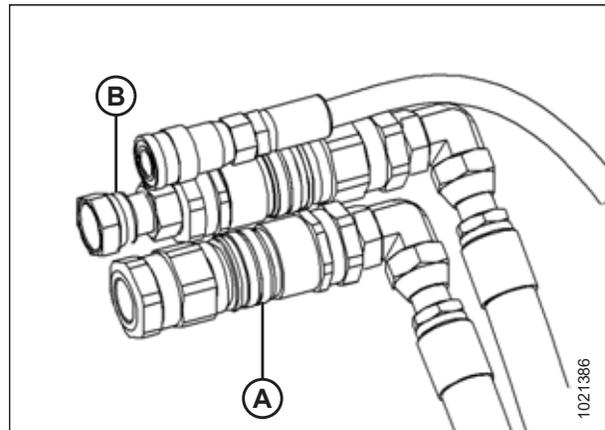


Figure 6.14: Hoses from Header

## ATTACHING HYDRAULIC AND ELECTRICAL COMPONENTS

6. Remove coupling and cap (A) and plug (B) from fittings on windrower.

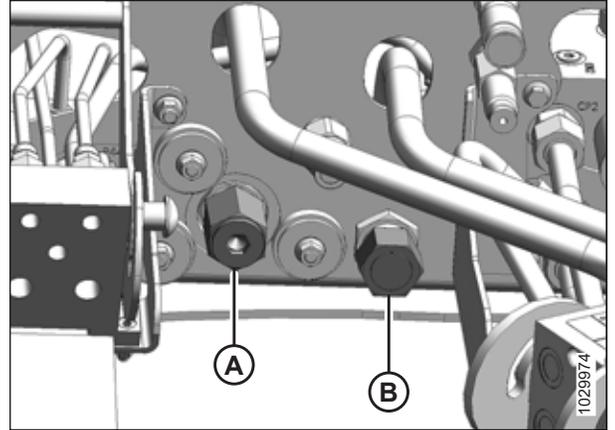


Figure 6.15: Windrower Hydraulics

7. Install male coupler onto pressure fitting (A), and female coupler onto return fitting (B) on windrower.
8. Tighten couplers onto fittings.

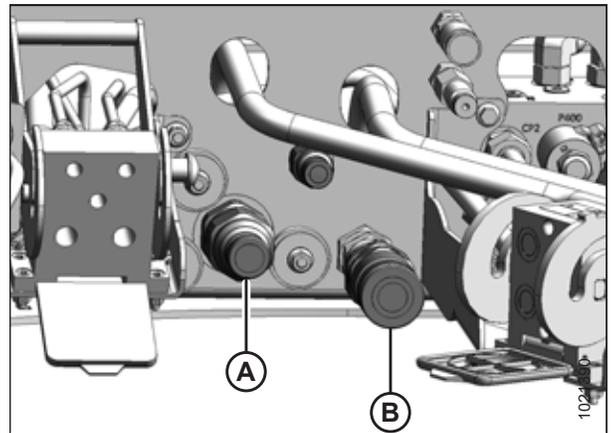


Figure 6.16: Couplers

9. Disconnect steel line (A) from elbow (B) and tee (C) (inside frame) and remove and discard line.

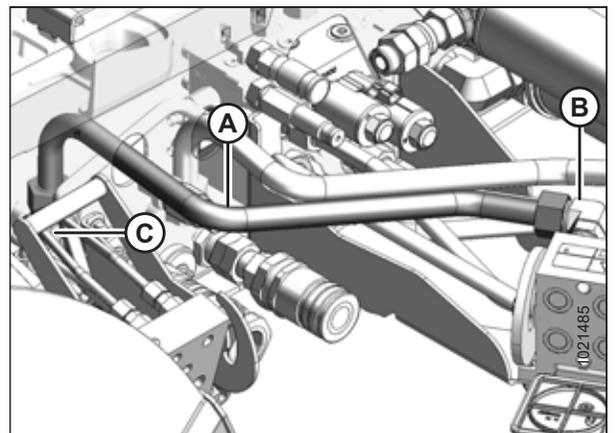


Figure 6.17: Windrower Couplers

## ATTACHING HYDRAULIC AND ELECTRICAL COMPONENTS

10. Install cap (A) on tee.
11. Reposition elbow (B) as shown.

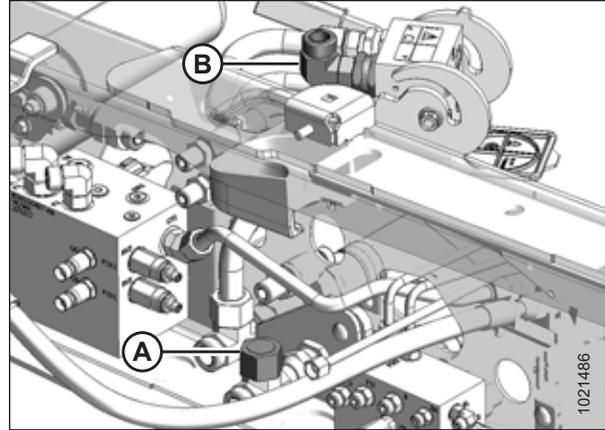


Figure 6.18: Windrower Header Drive

12. Remove two existing nuts (A) securing multicoupler to bracket (B).
13. Position new bracket (C) onto existing bolts and secure with existing nuts (A).
14. Install rubber coupler holder (D) into bracket (C).

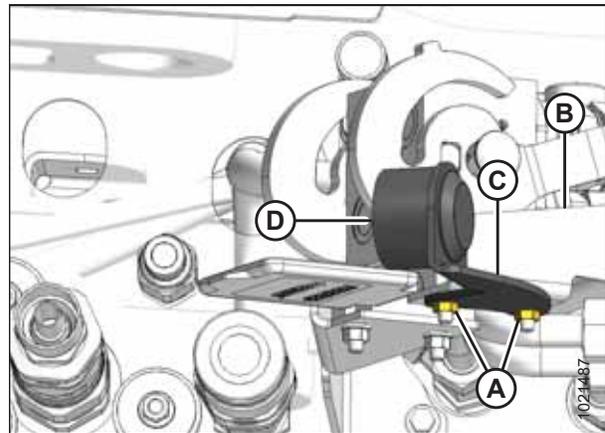


Figure 6.19: Windrower Couplers

15. Connect fitting (A) on knife pressure hose to elbow fitting (B).
16. Place female coupler (C) on knife pressure hose into holder (D).

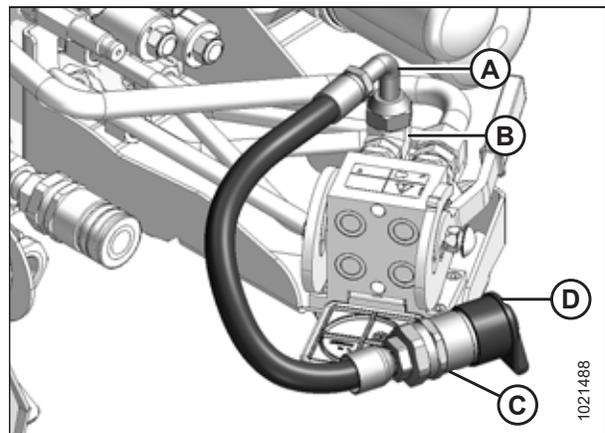


Figure 6.20: Windrower Coupler

## ATTACHING HYDRAULIC AND ELECTRICAL COMPONENTS

17. Attach the couplers to receptacles on the windrower as follows:
  - a. Connect pressure hose female coupler to receptacle (A)
  - b. Connect return hose male coupler to receptacle (B)
  - c. Connect case drain hose coupler to receptacle (C)
  - d. Connect the electrical harness to receptacle (D)

### IMPORTANT:

The hydraulic hoses should have enough slack to pass by multicoupler (E) without coming into contact with it. This will protect the hoses from rubbing against the multicoupler and becoming damaged. You can increase slack in the hoses by loosening and adjusting the hose holder on the front windrower leg, and pulling the hoses backward toward the windrower.

18. Push latch (B) to unlock platform (A).
19. Close the platform.
20. Calibrate the knife pump on the windrower. For instructions, refer to [6.2.1 Calibrating M1 Series Windrower Knife Drive and Header on the Harvest Performance Tracker Display](#), page 55.

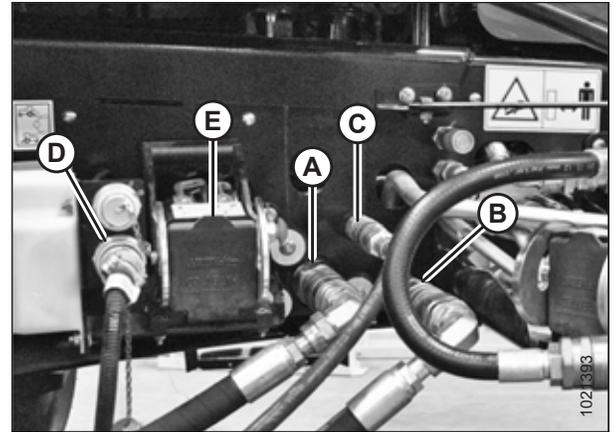


Figure 6.21: Hydraulic and Electrical Connections

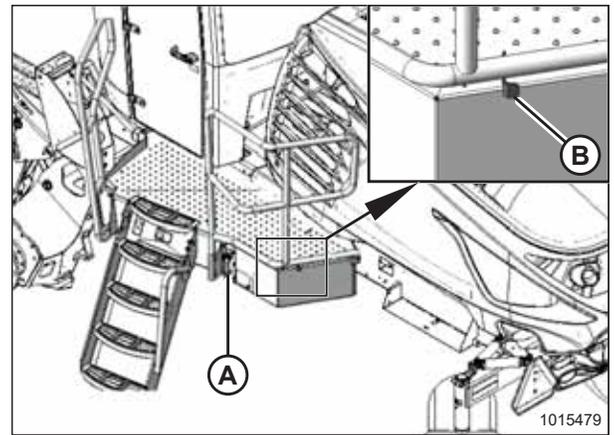


Figure 6.22: Left Cab-Forward Platform

### 6.2.1 Calibrating M1 Series Windrower Knife Drive and Header on the Harvest Performance Tracker Display

When an R1 Series Rotary Disc Header is attached to an M1 Series Windrower, the Harvest Performance Tracker (HPT) will recognize the header ID. The header must be calibrated to ensure that the knife drive pump output is accurate.

#### CAUTION

Before starting the machine, check to be sure all bystanders have cleared the area.

#### NOTE:

To calibrate the knife drive, the header must be attached and engaged. If the header is disengaged when calibration is selected, the message ENGAGE HEADER will appear on the screen.

## ATTACHING HYDRAULIC AND ELECTRICAL COMPONENTS

1. Start the engine.
2. Press soft key 5 (A) to open the Harvest Performance Tracker (HPT) main menu.

**NOTE:**

Calibrations **MUST** be performed with the engine running. Some calibrations will **NOT** be available with engine off.

3. Use HPT scroll knob (B) or the ground speed lever (GSL) scroll wheel (not shown) to highlight SETTINGS icon (C).
4. Press HPT scroll knob (B) or the GSL SELECT button (not shown) to activate the settings menu options.

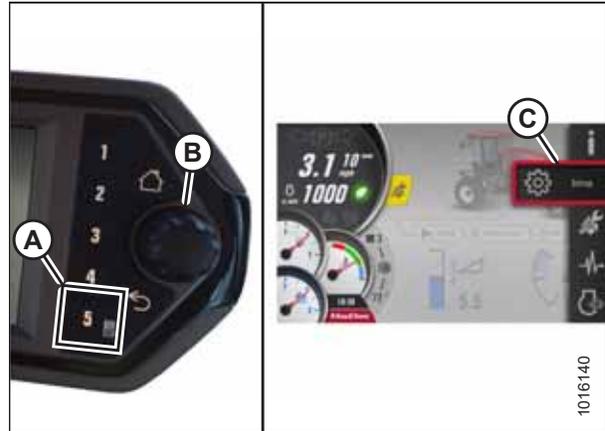


Figure 6.23: Opening the Main Menu

5. Scroll to WINDROWER SETTINGS icon (A) and press SELECT.
6. Scroll to CALIBRATION icon (B), and press SELECT to open the Calibration Selection screen.

**NOTE:**

The F3 shortcut button on the operator's console will also open the WINDROWER SETTINGS menu.

7. Select KNIFE DRIVE.

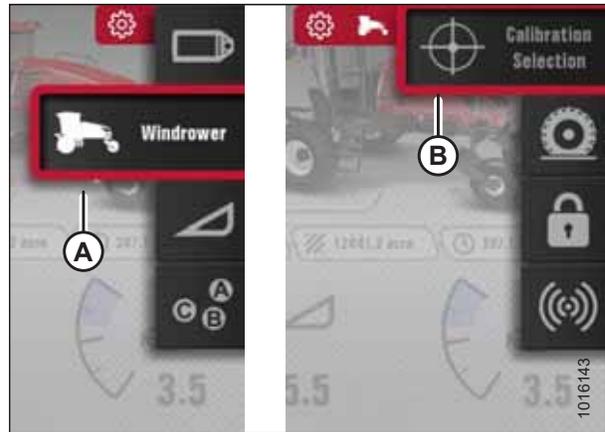


Figure 6.24: Windrower Settings Icon and Calibration Submenu Icon

8. Press the PLAY icon to begin the calibration process.

**NOTE:**

During the calibration sequence, the engine rpm and header speed will increase and decrease multiple times.

**NOTE:**

Press the X button (A) on the screen or use the HEADER DISENGAGE switch at any time during the calibration process to exit calibration without saving. The engine speed will return to the original rpm prior to starting the calibration process.



Figure 6.25: Calibration Page

## 6.3 Connecting R1 Series Rotary Disc Hydraulic and Electrical to M155 or M155E4 Windrowers

### WARNING

To avoid bodily injury or death from unexpected startup of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

#### NOTE:

M155 or M155E4 Windrowers require Disc Drive Manifold kit (MD #B4657) to hydraulically connect an R113 Rotary Disc Header.

1. Disengage and rotate lever (A) counterclockwise to FULLY-UP position.
2. Remove cap (B) securing the electrical connector to the frame.

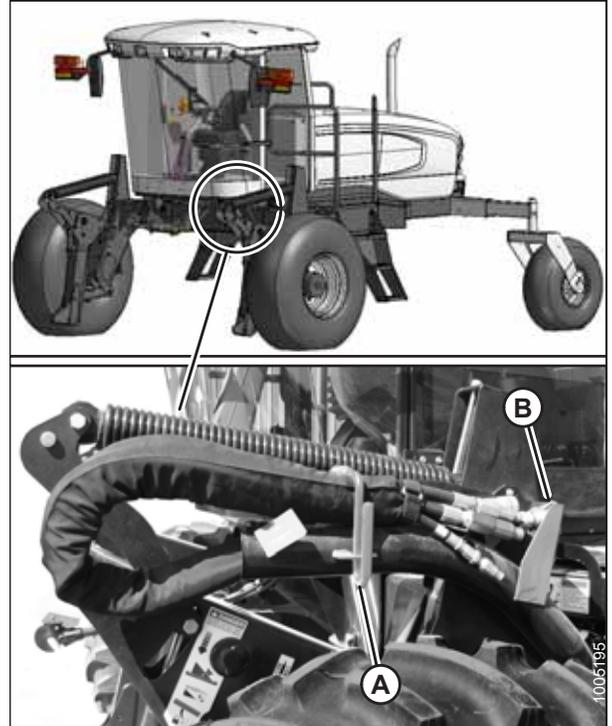


Figure 6.26: Hose Bundle

3. Move hose bundle (A) from the windrower and rest the bundle on the header.

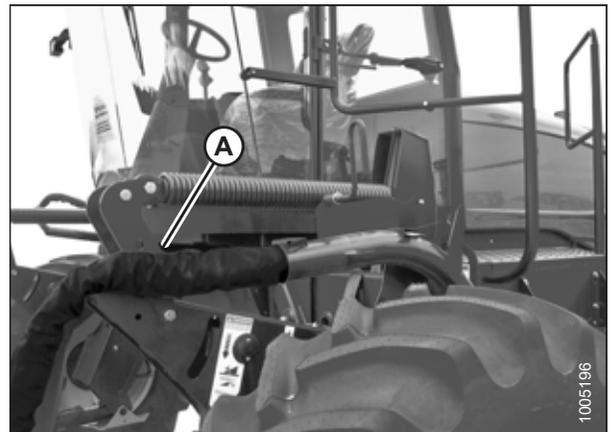


Figure 6.27: Hose Bundle

## ATTACHING HYDRAULIC AND ELECTRICAL COMPONENTS

4. Position the hose support with lower bolt (A) in the forward hole as shown. Loosen both bolts, and adjust as required.

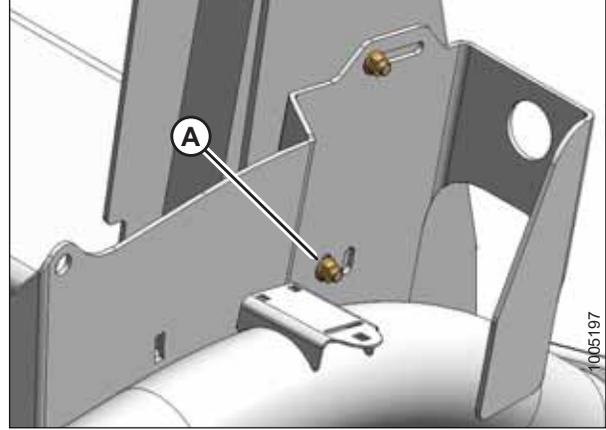


Figure 6.28: Hose Support

5. Move the windrower's left (cab-forward) platform (A) to the OPEN position. For instructions, refer to the windrower operator's manual.

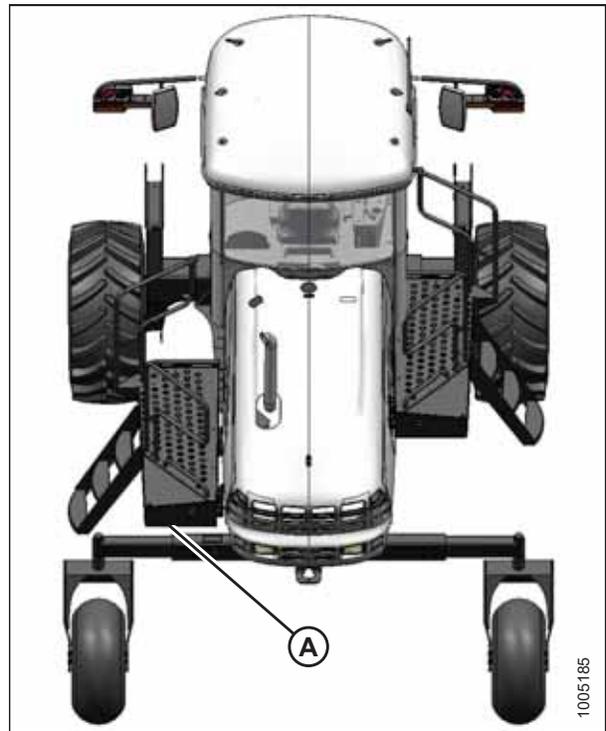


Figure 6.29: Windrower Left Platform in Open Position

## ATTACHING HYDRAULIC AND ELECTRICAL COMPONENTS

6. Route windrower hose bundle (A) through hose support (B) on the header.
7. Route pressure hose (C) from the header through support (B) to the windrower.

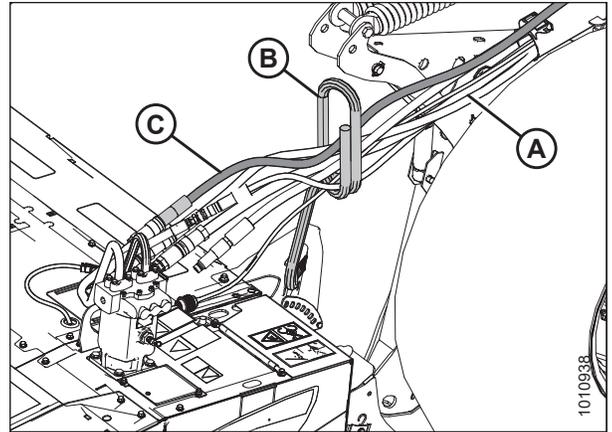


Figure 6.30: Hose Bundle

### IMPORTANT:

Keep open lines and ports clean.

8. Connect pressure hose (A) routed from the header to port M2 on the disc drive valve (middle block).

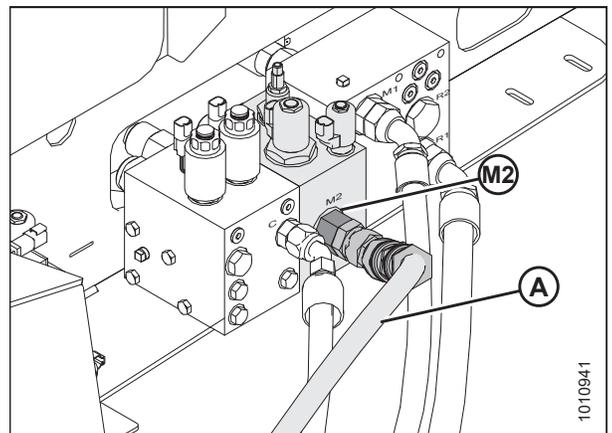


Figure 6.31: Hydraulic Connections

## ATTACHING HYDRAULIC AND ELECTRICAL COMPONENTS

9. Remove caps and plugs on hoses from the windrower and lines on the header.
10. Connect pressure hose (B) from drive manifold port M1 to steel line (A) attached to motor port A.

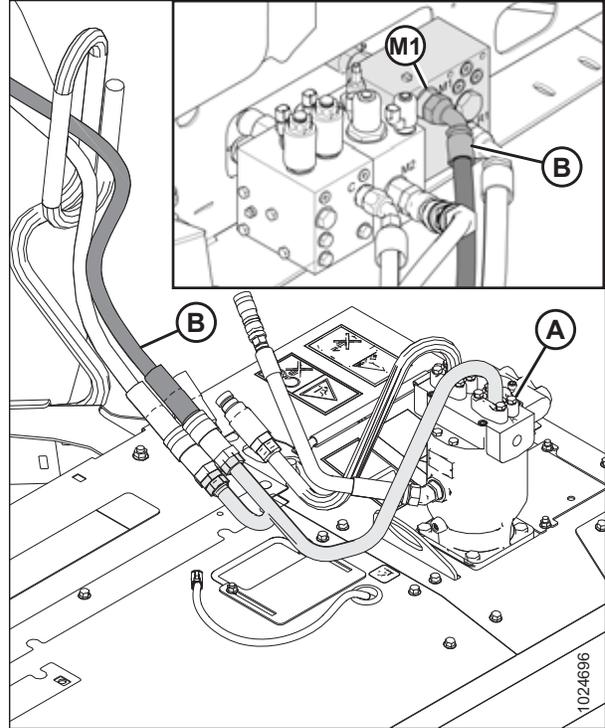


Figure 6.32: Hydraulic Connections

11. Connect return hose (A) from drive manifold port R1 to steel line (B) attached to motor port B.

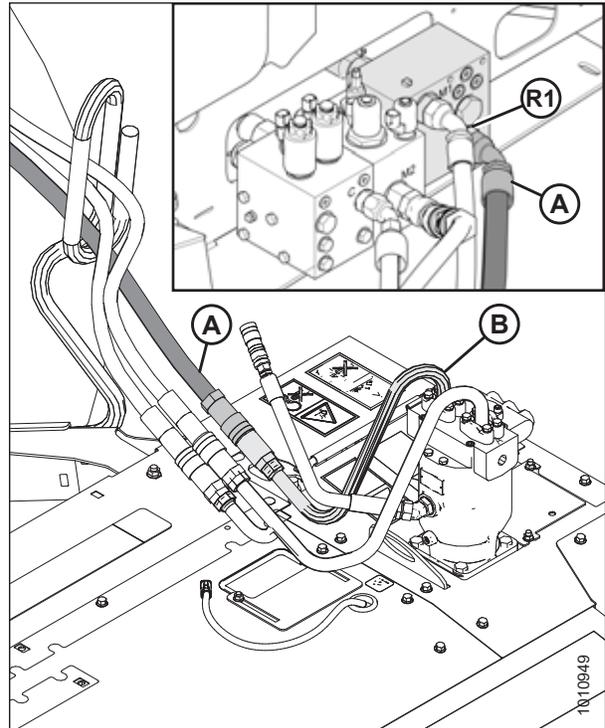


Figure 6.33: Hydraulic Connections

## ATTACHING HYDRAULIC AND ELECTRICAL COMPONENTS

### NOTE:

If the windrower is equipped with a reverser valve (A) for an auger header, route return hose (C) from port R1 on the reverser valve to steel line (B) attached to motor port B.

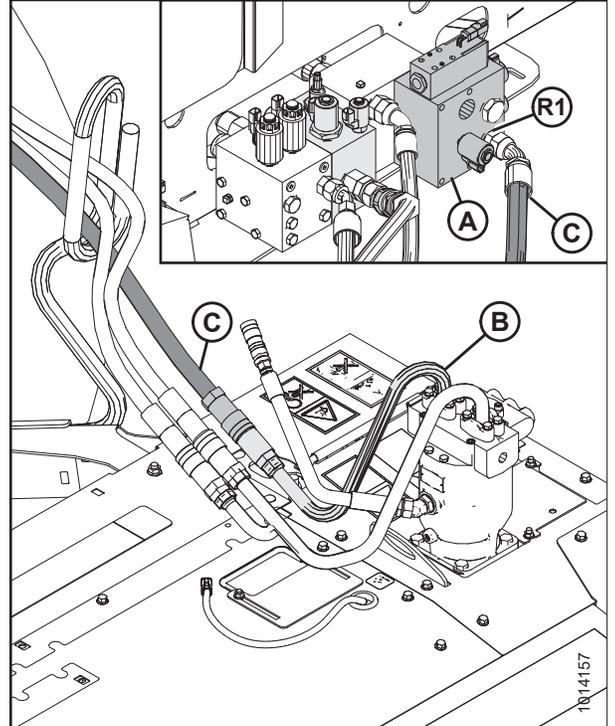


Figure 6.34: Windrower Hose Connections with Reverser

12. Connect case drain hose (A) from lift manifold port T3 to the fitting attached to motor port D.

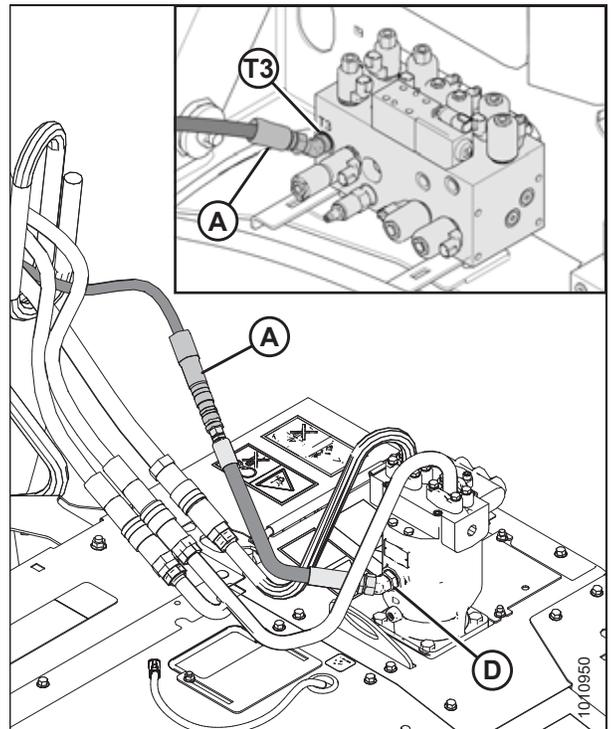


Figure 6.35: Hydraulic Connections

## ATTACHING HYDRAULIC AND ELECTRICAL COMPONENTS

13. Connect electrical harness (A) from the windrower to the electrical connector on the header.

**NOTE:**

Hydraulic hoses removed from the illustration to improve clarity.

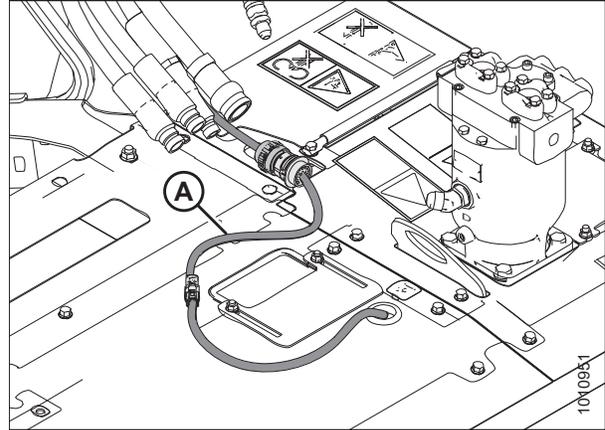


Figure 6.36: Electrical Connection

14. Lower and lock lever (A). Secure hose (B) with three cinch straps (C).

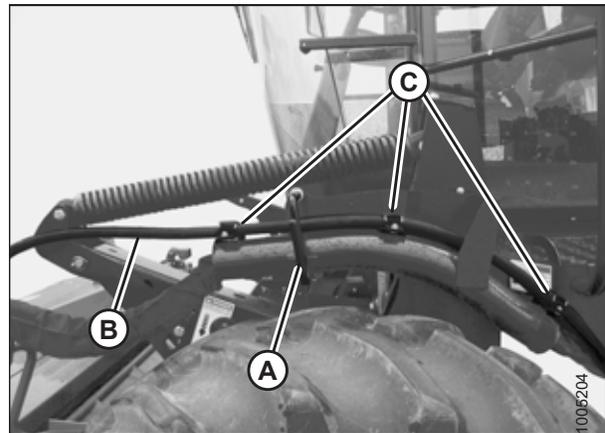


Figure 6.37: Hose Bundle

## ATTACHING HYDRAULIC AND ELECTRICAL COMPONENTS

15. Move platform (A) to the CLOSED position. For instructions, refer to the windrower operator's manual.

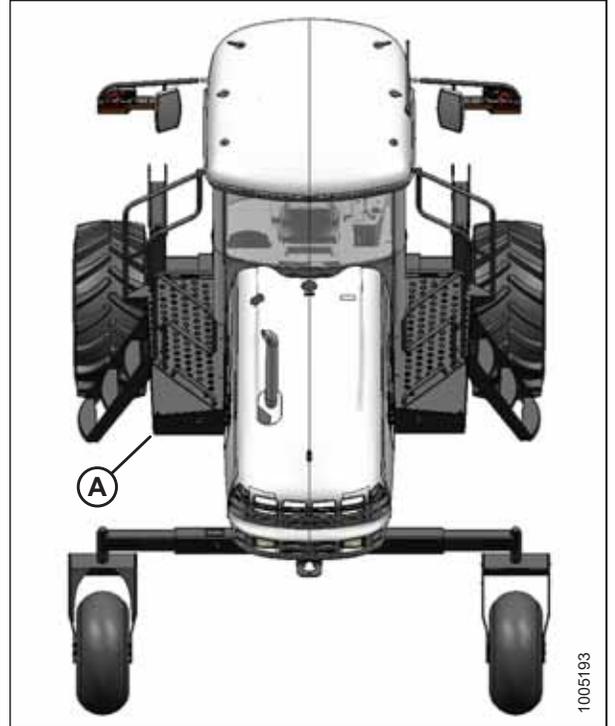


Figure 6.38: Top View of Windrower

## 6.4 Connecting R113 Rotary Disc Header Hydraulic and Electrical to M205 Windrower

**IMPORTANT:**

The M205 Windrower requires compatibility kit MD #257188 to connect to the R113 Rotary Disc Header, and the header must be reconfigured before installing this kit. To connect R113 SP hydraulics to an M205 windrower, refer to the instructions for kit MD #257188, or *Connecting R113 Rotary Disc Header Hydraulics and Electrical – M205 Windrower* in the R1 Series Rotary Disc Header Operator's Manual.

## Chapter 7: Unpacking Curtains

### WARNING

Ensure the cutterbar is completely clear of foreign objects. These objects can be ejected with considerable force when the machine is started and may result in serious injury or machine damage.

1. **R113 SP only:** Remove two bolts (A) securing cutterbar doors to frame.

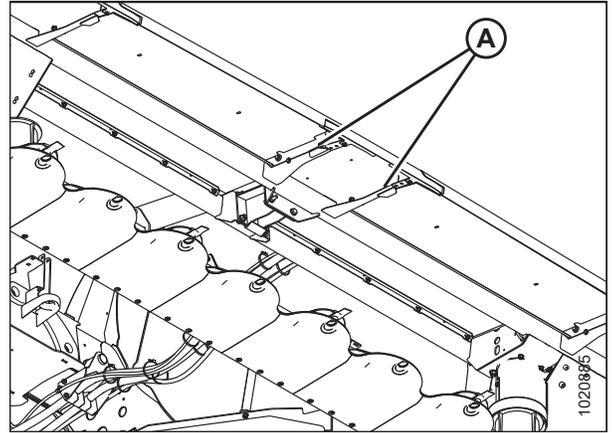


Figure 7.1: R113 SP Cutterbar Doors – View Looking Up

2. **R116 SP only:** Remove four bolts (A) securing cutterbar doors to frame.

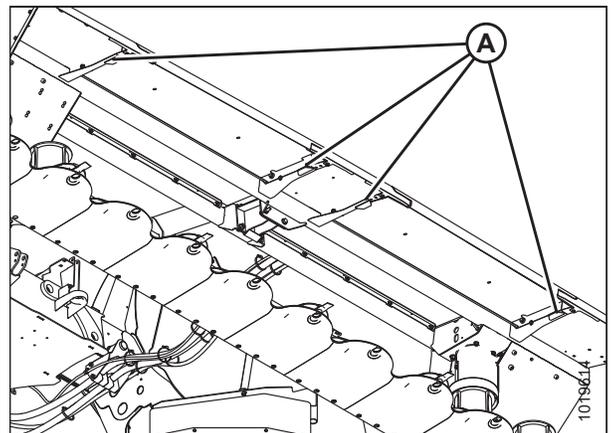


Figure 7.2: R116 SP Cutterbar Doors – View Looking Up

## UNPACKING CURTAINS

3. Remove shipping wire (A) around curtains.

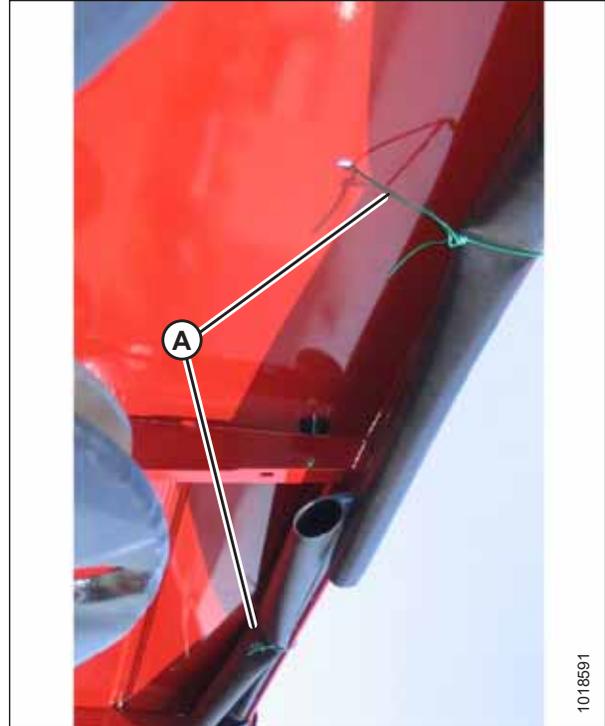


Figure 7.3: Curtain Secured for Shipping

4. Open cutterbar doors. For instructions, refer to [11.4.1 Opening Cutterbar Doors, page 101](#).

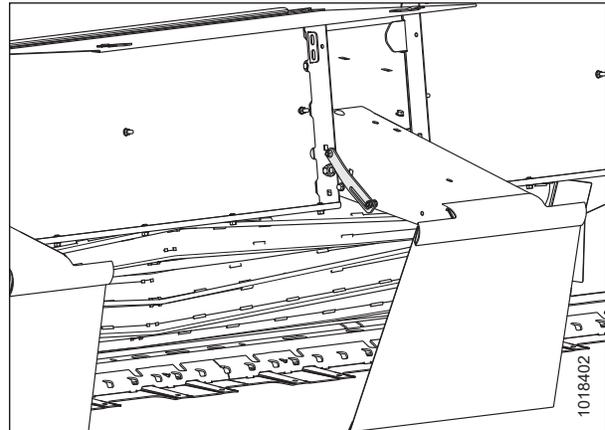


Figure 7.4: Cutterbar Doors Open

## UNPACKING CURTAINS

5. **For export headers only:** insert a screwdriver (or equivalent) through hole (A) in door into notch in latch (B) and push latch to disengage.
6. Check cutterbar area for debris and foreign objects. Ensure all material is removed.

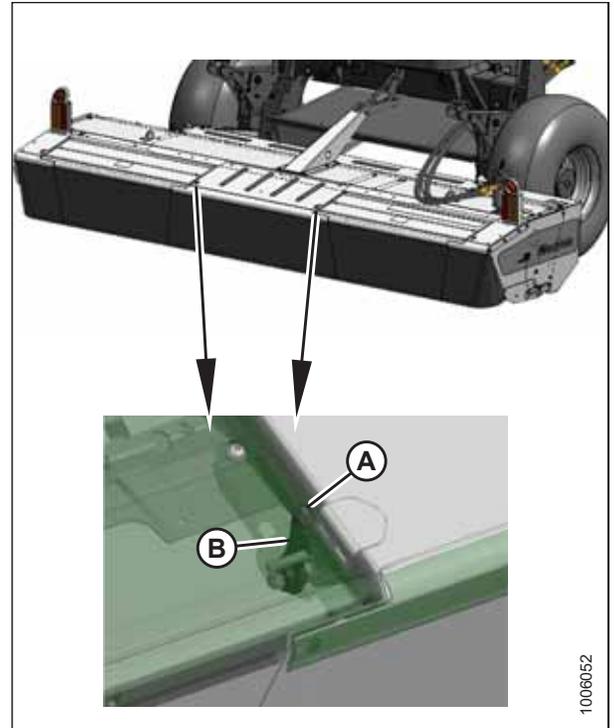


Figure 7.5: Export Headers – Latch on Cutterbar Doors

7. Close cutterbar doors. For instructions, refer to [11.4.3 Closing Cutterbar Doors, page 103](#).
8. Ensure that curtains hang properly and completely enclose cutterbar area. Minor creases in curtains will eventually straighten out.



Figure 7.6: Curtain – Unacceptable

UNPACKING CURTAINS



Figure 7.7: Curtain – Acceptable

## Chapter 8: Installing Options

Install options (if supplied with shipment) according to the instructions supplied with each kit.

### 8.1 Installing Tall Crop Dividers

To install the Tall Crop Divider kit (MD #B5800), follow these steps:

#### **WARNING**

To avoid bodily injury or death from unexpected startup of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Lower disc header fully.
2. Stop the engine, and remove the key.
3. Unpack the Tall Crop Divider kit.
4. Open cutterbar doors.
5. Remove four bolts (A) from divider (B).

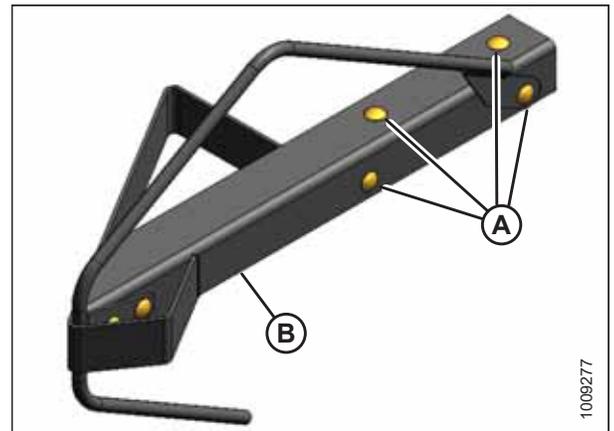


Figure 8.1: Tall Crop Divider – Left Shown, Right Opposite

6. Position left divider (B) on left front corner, and install with four bolts (A) and nuts in existing holes. Tighten hardware.

#### **NOTE:**

Mounting holes in rotary disc header should be vacant. If necessary, remove fasteners.

7. Repeat for right side of the header.
8. Close the cutterbar doors.

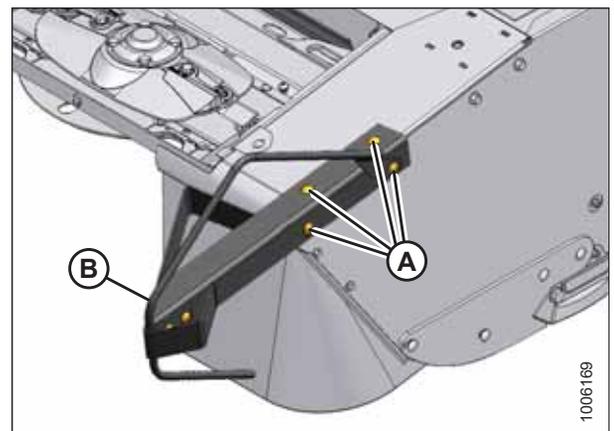


Figure 8.2: Tall Crop Divider – Left Shown, Right Opposite



## Chapter 9: Lubricating the Rotary Disc Header

### WARNING

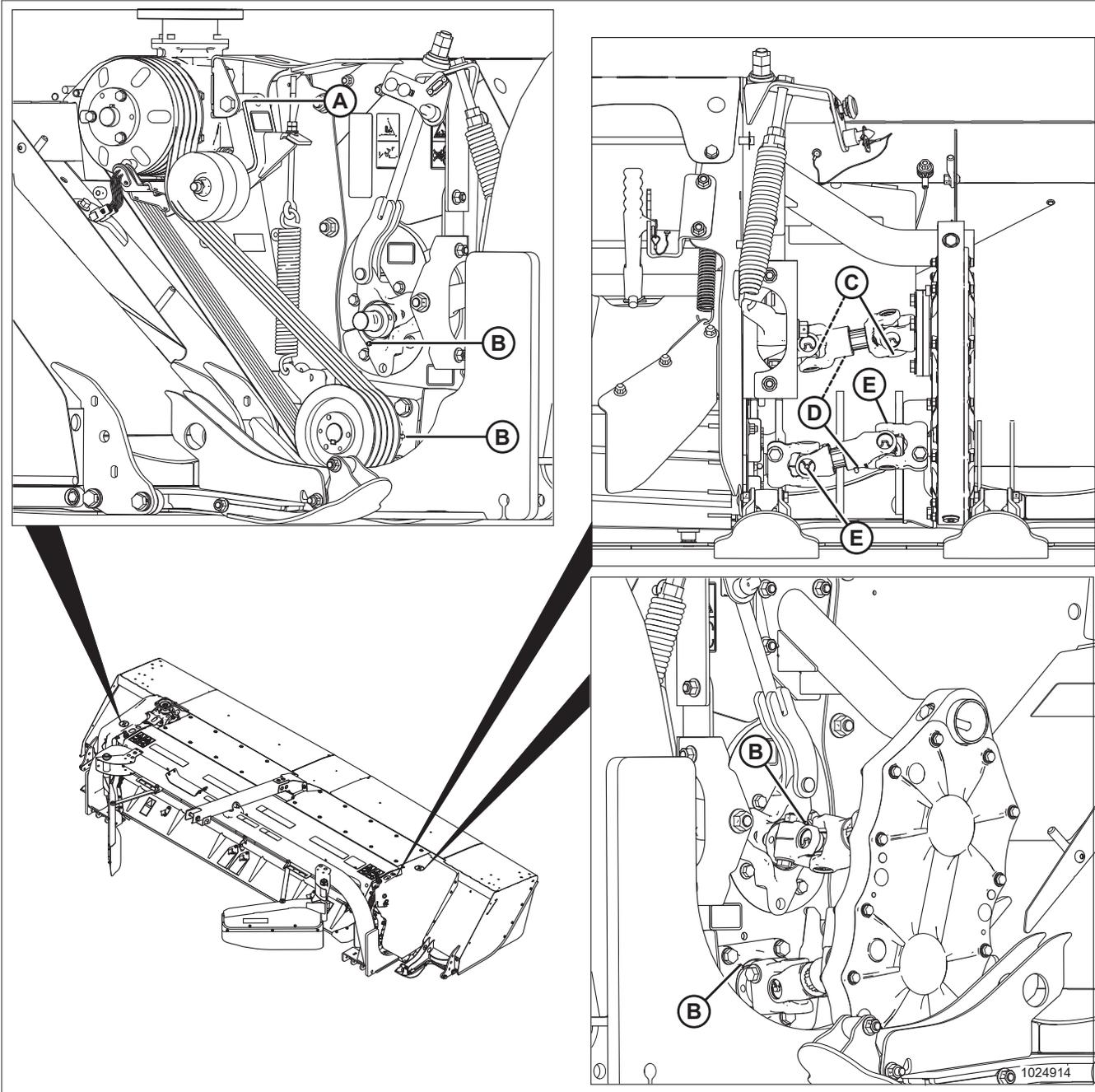
To avoid bodily injury or death from unexpected startup of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

The rotary disc header has been lubricated at the factory. However, you should lubricate the rotary disc header prior to delivery to offset the effects of weather during outside storage and transport, and to familiarize yourself with the machine.

Unless otherwise specified, use high-temperature, extreme-pressure (EP2) performance grease with 1% max molybdenum disulphide (NLGI grade 2) lithium base.

Refer to [9.1 Lubrication Locations, page 72](#) for a list of grease points on both the right and left side of the header.

## 9.1 Lubrication Locations



A - Idler/Tensioner Pivot  
D - Slip Joints, Conditioner Drivelines<sup>2</sup>

B - Bearing, Roller Conditioner (4 Places)  
E - U-Joint, Lower Driveline (2 Places)

C - U-Joint, Upper Driveline (2 Places)

2. Use high-temperature, extreme-pressure (EP2) performance grease with 10% max molybdenum disulphide (NLGI grade 2) lithium base.

## Chapter 10: Performing Predelivery Checks

Perform final checks and adjustments as listed on the Predelivery Checklist (yellow sheet at the back of this instruction) to ensure the machine is field-ready. Refer to the referenced pages as indicated on the Predelivery Checklist for detailed instructions.

The Operator or the Dealer should retain the completed Predelivery Checklist.

### 10.1 Checking Conditioner Drive Belt

1. Open left driveshield. For instructions, refer to [11.2 Opening Driveshields, page 98](#).
2. Check that belt (A) is properly tensioned and positioned on the pulleys. Overall spring length (B) should be 365 mm (14 3/8 in.). If adjustment is required, refer to [10.1.1 Adjusting Conditioner Drive Belt, page 73](#).
3. Check that adjuster nuts (C) are tight.
4. Close driveshield. For instructions, refer to [11.3 Closing Driveshields, page 100](#).

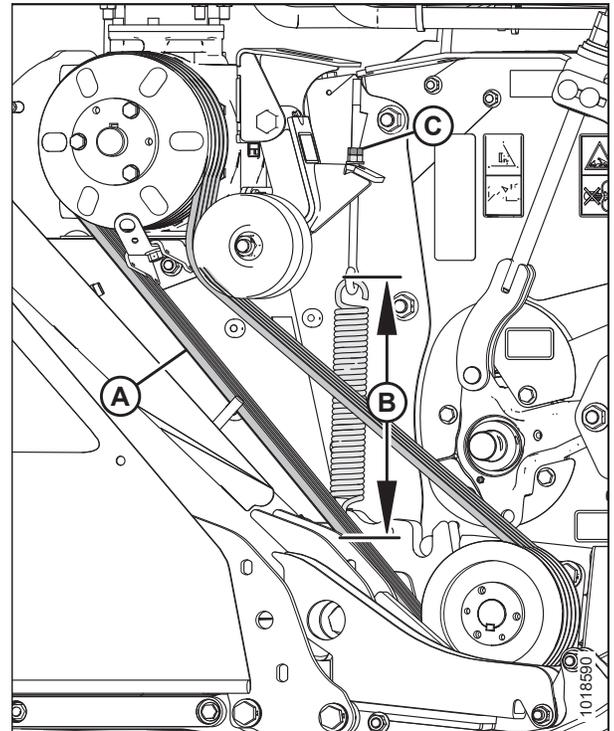


Figure 10.1: Conditioner Drive Belt

#### 10.1.1 Adjusting Conditioner Drive Belt

1. Open the left driveshield. For instructions, refer to [11.2 Opening Driveshields, page 98](#).

## PERFORMING PREDELIVERY CHECKS

2. Turn jam nut (A) counterclockwise to unlock tension adjustment.
3. Turn adjuster nut (C) clockwise to increase spring length (tension) or counterclockwise to decrease spring length (relax).
4. Set overall spring length (B) to 365 mm (14-3/8 in.).
5. Close driveshield. For instructions, refer to [11.3 Closing Driveshields, page 100](#).

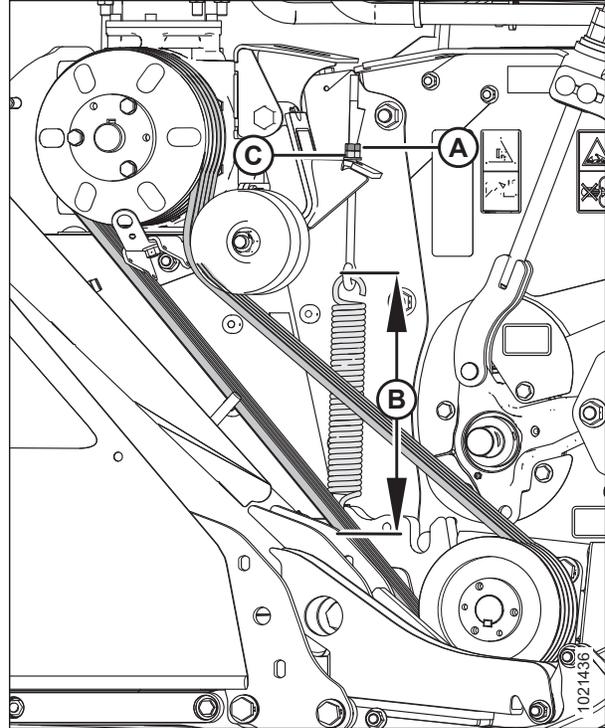


Figure 10.2: Conditioner Drive Belt

## 10.2 Checking Skid Shoes

All skid shoes (A) should be at the same position, either up (shown at right) or down.

**NOTE:**

The R113 Rotary Disc Header is equipped with one skid shoe at each end of the machine.

If adjustment is required, refer to the disc header operator's manual.

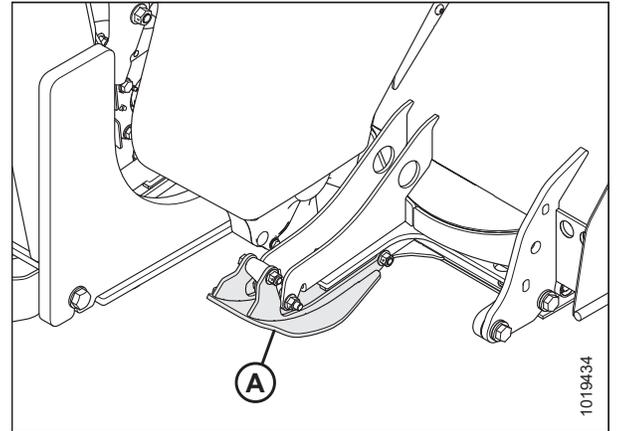


Figure 10.3: R113 SP Skid Shoe

## 10.3 Checking Float – M1 Series Windrowers

### WARNING

To avoid bodily injury or death from unexpected startup of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

### WARNING

Never start or move the machine until you are sure all bystanders have cleared the area.

1. Start the engine.
2. Use HEADER TILT switches (A) on the ground speed lever (GSL) to set the center-link to the mid-range position (5.0 on the Harvest Performance Tracker [HPT]).

3. Using HEADER DOWN switch (B), lower the rotary disc header fully and with the header lift cylinders fully retracted.

**NOTE:**

Ensure the header is level with the ground with zero tilt.

4. Shut down the engine, and remove the key from the ignition.
5. Grasp one end of the header and lift. Lifting force should be 426–471 N (95–105 lbf) and should be the same at both ends.

**NOTE:**

Increasing the float value on the HPT makes the header feel lighter.

### 10.3.1 Setting the Float – M1 Series Windrowers

The float can be set for windrowing with the cutterbar on the ground.

The optimum float setting lets the rotary disc header follow the contour of the terrain. Proceed as follows:

1. Set center-link to mid-range position (5.0 on the Harvest Performance Tracker [HPT]). For instructions, refer to the windrower operator's manual.
2. Lower the header until the cutterbar is on the ground.

**NOTE:**

To minimize scooping rocks when operating at the flattest header angle, lower the header skid shoes. For instructions, refer to the header operator's manual.

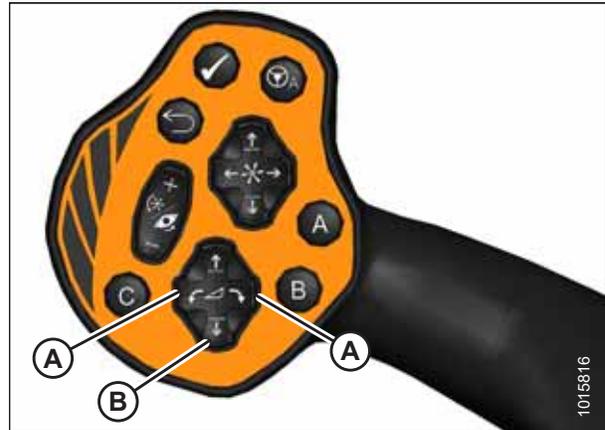


Figure 10.4: GSL

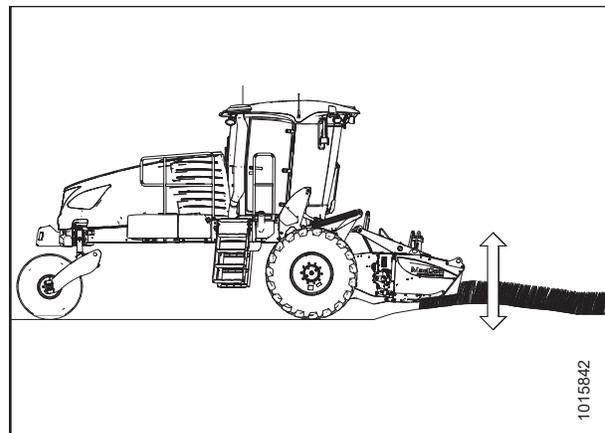


Figure 10.5: Header Float – Cutterbar on Ground

## PERFORMING PREDELIVERY CHECKS

3. Press rotary scroll knob (A) on the HPT to display the QuickMenu system.
4. Rotate scroll knob (A) to highlight header float icon (B) and press scroll knob to select.



Figure 10.6: HPT Run Screen

5. Turn scroll knob (A) to highlight left (B) or right (C) float and press knob (A) to activate selection.
6. Rotate scroll knob (A) to adjust the float setting and press the knob when finished. Float is now set.

### NOTE:

Float adjustments of 1.0 (out of 10) change the header weight at the cutterbar by approximately 91 kg (200 lb.). Adjust float in increments of 0.05 to optimize field performance.

7. Use soft key 3 (D) to remove/resume float and deck position to previous setting for the attached header.



Figure 10.7: HPT Left and Right Float Settings

## 10.4 Checking Float – M155 or M155E4

The M155 and M155E4 are equipped with primary (coarse) and secondary (fine) float adjustment systems. The primary adjustment uses drawbolts to change the tension on the springs in the lift linkages. The secondary adjustment uses hydraulic cylinders to change the spring tension.

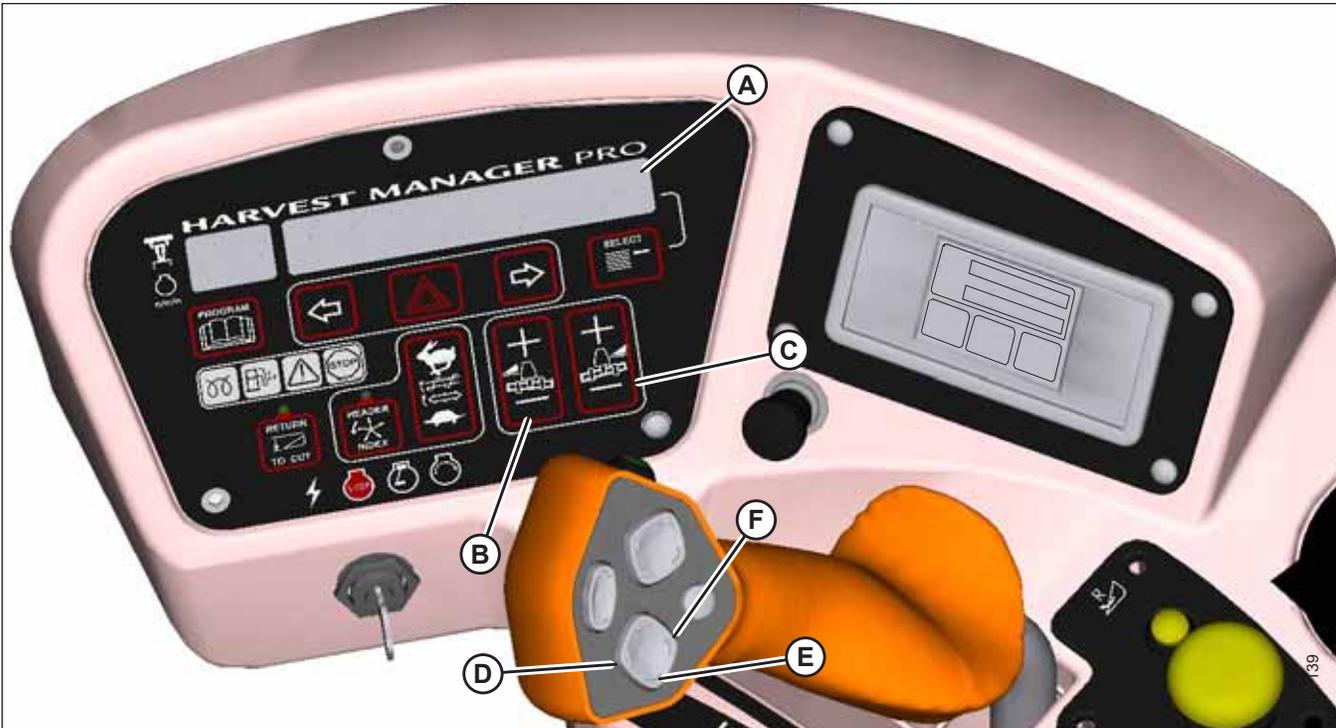


Figure 10.8: Cab Display Module (CDM) – M155E4 Shown, M155 Similar

A - CDM Display  
D - Header Tilt Down

B - Left Float Adjustment  
E - Header Lower

C - Right Float Adjustment  
F - Header Tilt Up

Check header float as follows:

### WARNING

To avoid bodily injury or death from unexpected startup of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

### WARNING

Check to be sure all bystanders have cleared the area.

1. Start the engine.
2. Lower the header to the ground.
3. Using HEADER TILT switches (D) and (F), set the center-link to mid-range position (5.0 on CDM [A]).
4. Using HEADER DOWN switch (E), lower the header fully with lift cylinders fully retracted.
5. Set left and right float fine adjustments on the CDM to approximately 5.0 as follows:
  - a. Using FLOAT SELECTOR switch (B), push + to increase float or – to decrease float on the left side of the header. CDM display (A) will show the selected float for the left side, for example, 5.0 L FLOAT R XX.X.

## PERFORMING PREDELIVERY CHECKS

- b. Repeat for the right side float with switch (C). The display will show float for both sides, for example, 5.0 L FLOAT R 5.0.
6. Shut down the engine, and remove the key from the ignition.
7. Grasp the end of the header and lift. The force to lift the end of the header should be 426–471 N (95–105 lbf) and should be approximately the same at both ends.

### 10.4.1 Adjusting Float Using Drawbolts – M155, and M155E4

Coarse float adjustment is done using the drawbolts located on both sides of the windrower.

#### **WARNING**

To avoid bodily injury or death from unexpected startup of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

#### **WARNING**

Check to be sure all bystanders have cleared the area.

1. Start the engine.
2. Using HEADER UP switch (A) on the ground speed lever (GSL), raise the header fully.
3. Shut down the engine, and remove the key.

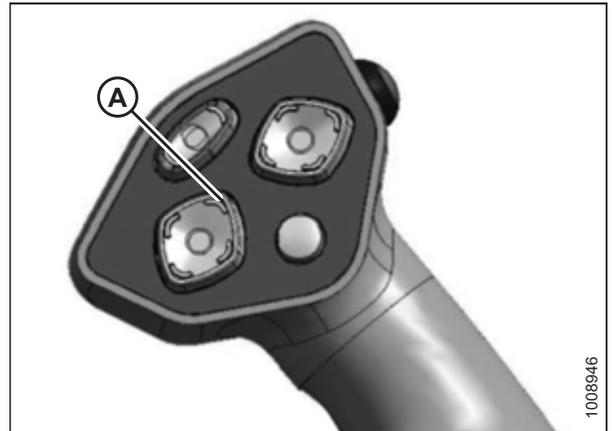


Figure 10.9: GSL

4. Turn drawbolt (A) clockwise to increase float (makes header lighter) or counterclockwise to decrease float (makes header heavier).
5. Recheck the header float.

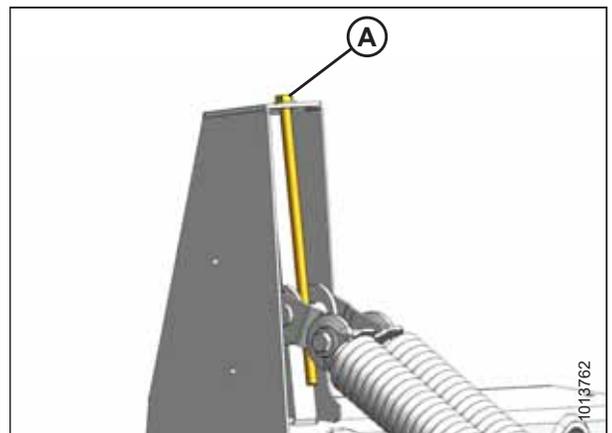


Figure 10.10: Header Float Adjustment

## 10.5 Checking Roll Timing

Check roll timing if excessive noise is coming from the conditioner rolls.

Roll timing is factory-set and should not require adjustment; however, if there is excessive noise coming from the conditioner rolls, the timing will need to be adjusted. For instructions, refer to the header operator's manual.

### 10.5.1 Adjusting Roll Timing

#### WARNING

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Shut down the engine, and remove the key from the ignition.
2. On the upper roll, loosen four bolts (A) securing yoke plate (B).

**NOTE:**

Only three of the four bolts are shown in the illustration.

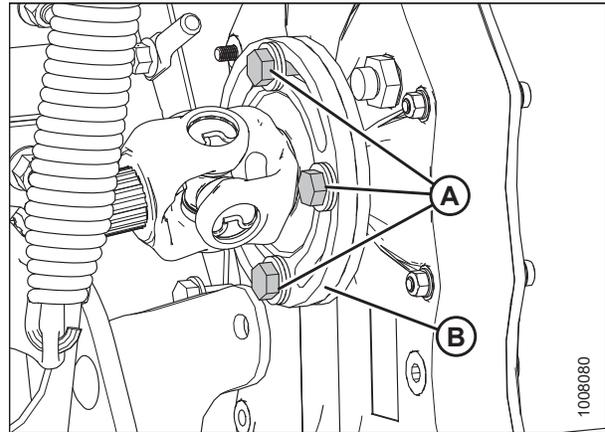


Figure 10.11: Conditioner Drive

3. Secure bottom roll (A).
4. Manually rotate upper roll (B) in a counterclockwise direction until it stops.
5. Make a mark (C) across yoke (D) and gearbox flange (E).

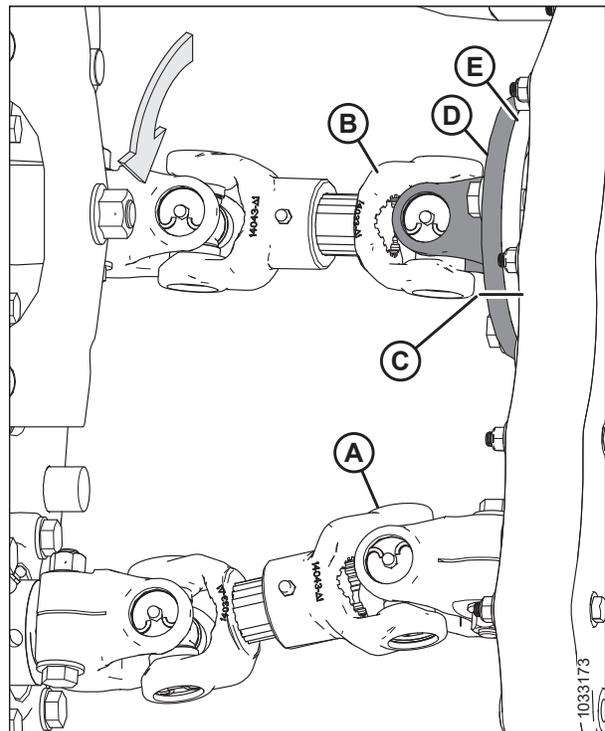


Figure 10.12: Conditioner Drive

## PERFORMING PREDELIVERY CHECKS

6. Secure bottom roll (A).
7. Manually rotate upper roll (B) in a clockwise direction until it stops.
8. Make a mark (C) across yoke (D) and gearbox flange (E).

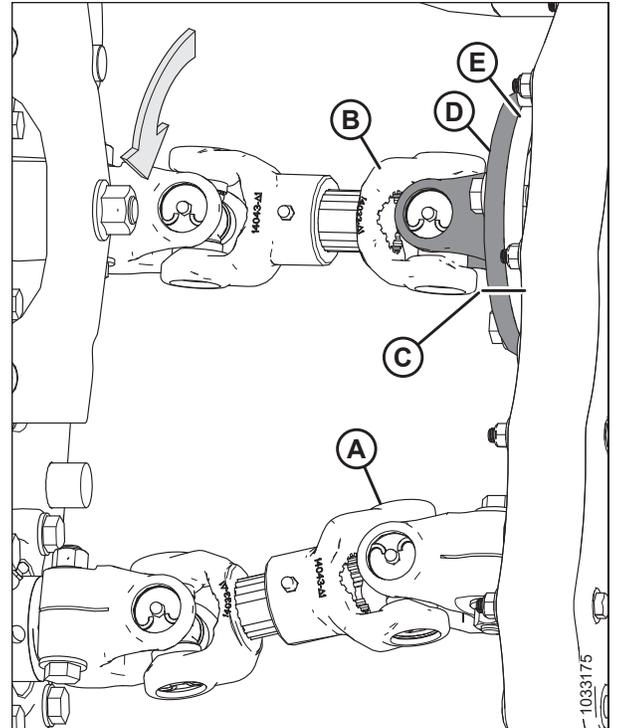


Figure 10.13: Conditioner Drive

9. Determine center point (A) between the two marks on the yoke plate, and place a third mark.
10. Rotate upper roll (B) counterclockwise until the mark on the gearbox flange lines up with the third (center) mark.

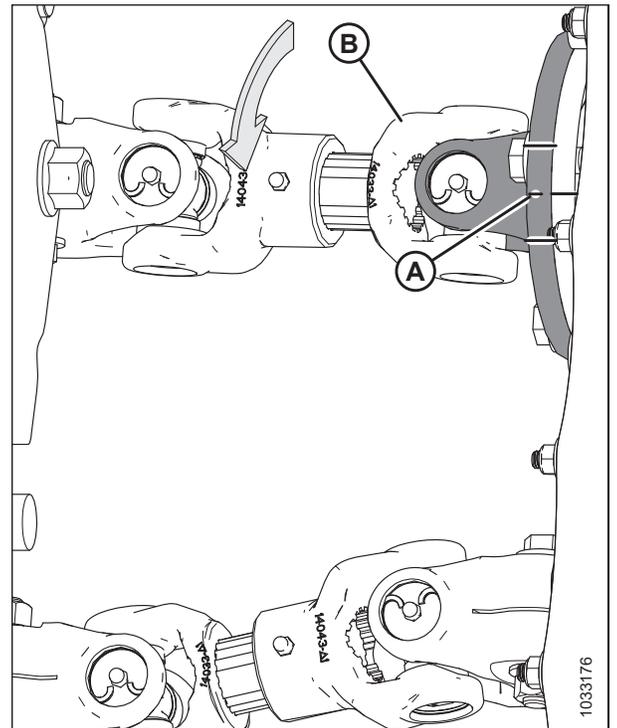


Figure 10.14: Conditioner Drive

## PERFORMING PREDELIVERY CHECKS

11. Ensure the threads on four bolts (A) are clean and free of lubricant.

**NOTE:**

Only three of the four bolts are shown in the illustration.

12. Apply medium-strength threadlocker (Loctite® 242 or equivalent), and tighten bolts (A). Torque to 95 Nm (70 lbf-ft).

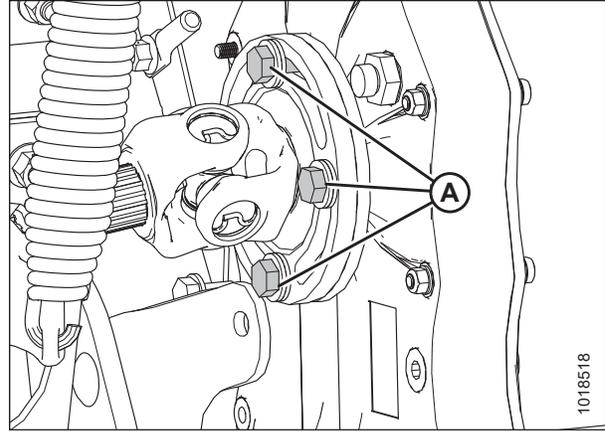


Figure 10.15: Conditioner Drive

## 10.6 Checking and Adding Lubricant – Conditioner Roll Timing Gearbox

The conditioner roll timing gearbox is located inside the drive compartment at the right side of the disc header.

### WARNING

To avoid bodily injury or death from unexpected startup of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

#### IMPORTANT:

Check the conditioner roll timing gearbox lubricant level when the lubricant is warm. If the lubricant is cold, idle the machine for approximately 10 minutes prior to checking.

1. Lower disc header to the ground, and adjust header angle with center-link so that cutterbar is level.
2. Shut down the engine, and remove the key from the ignition.
3. Lift up doors (A) at the front of the machine.

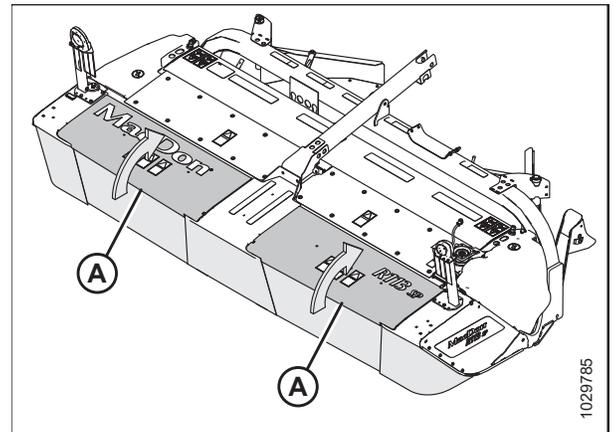


Figure 10.16: Cutterbar Doors and Curtains – R113 SP Shown, R16 SP Similar

4. Use a spirit (bubble) level and check that cutterbar is level in fore-aft direction. Adjust header angle as required.
5. Open the right driveshield. For instructions, refer to [11.2 Opening Driveshields, page 98](#).
6. Clean around lubricant sight glass (A) and breather plug (B) on inboard side of the conditioner roll timing gearbox.
7. Ensure that the lubricant level is at the top of the sight glass. If necessary, add lubricant through plug (B). Refer to [11.1 Recommended Lubricants, page 97](#) for lubricant information.
8. Replace plug (B) and tighten.
9. Close the right driveshield. For instructions, refer to [11.3 Closing Driveshields, page 100](#).

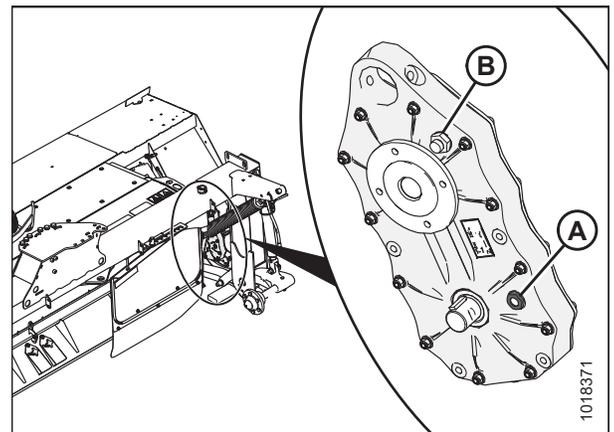


Figure 10.17: Roll Timing Gearbox

### CAUTION

To avoid injury, keep hands and fingers away from corners of doors when closing.

## PERFORMING PREDELIVERY CHECKS

10. Pull down on door (A) from the top to close.
11. Ensure that curtains hang properly and completely enclose the cutterbar area.

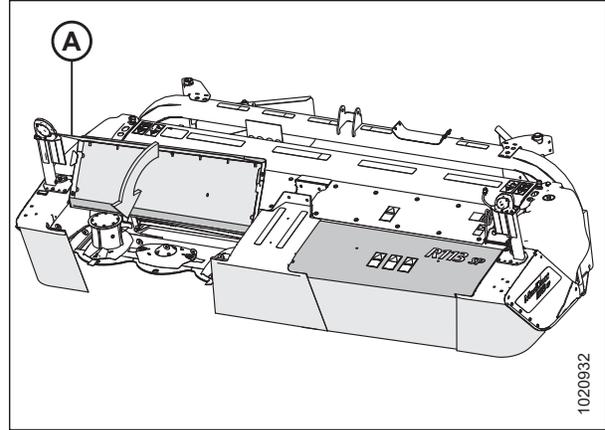


Figure 10.18: Cutterbar Doors and Curtains

## 10.7 Checking Header Drive Gearbox Lubricant

The header drive gearbox is located on the left side of the header.

### WARNING

To avoid bodily injury or death from unexpected startup of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Lower header until the top of the header is parallel with the ground.
2. Shut down the engine, and remove the key from the ignition.
3. Open the left cutterbar door. For instructions, refer to [11.4.1 Opening Cutterbar Doors, page 101](#).
4. The gearbox is located inside the cutterbar area at the top right corner (looking into cutterbar area from front). Clean the area around plug (A).
5. Remove the plug in hole (A) with a 13 mm (1/2 in.) socket.
6. Ensure lubricant slightly runs out of hole (A).
7. If necessary, remove plug (B) and add lubricant (SAE 80W-140) to the gearbox through hole (B) until lubricant runs out of hole (A).
8. Reinstall the plugs and tighten.

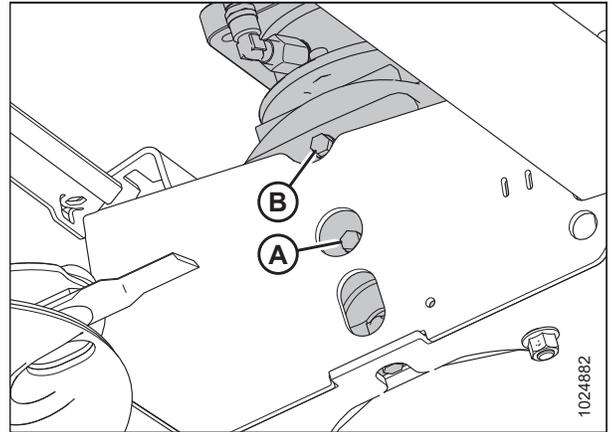


Figure 10.19: Header Drive Gearbox

### CAUTION

To avoid injury, keep hands and fingers away from corners of doors when closing.

9. Close the left cutterbar door. For instructions, refer to [11.4.3 Closing Cutterbar Doors, page 103](#).

## 10.8 Checking and Adding Lubricant – Cutterbar

### WARNING

To avoid bodily injury or death from unexpected startup of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

### WARNING

Exercise caution when working around the blades. Blades are sharp and can cause serious injury. Wear gloves when handling blades.

1. Park the machine on a flat, level surface.
2. Lower the rotary disc header onto 25 cm (10 in.) blocks under both ends of the cutterbar.
3. Shut down the engine, and remove the key from the ignition.
4. Open the cutterbar doors.
5. Use a spirit (bubble) level (A) to ensure the cutterbar is level in both directions. Adjust position accordingly.

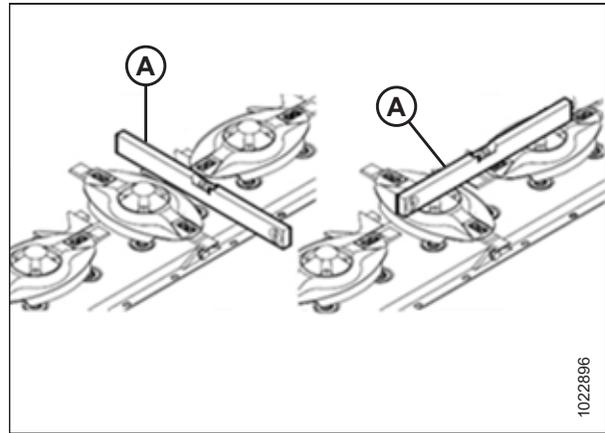


Figure 10.20: Spirit Level on Cutterbar

6. Clean area around plug (A). Place a 5 liter (5.2 US qts) capacity container under plug (A).
7. Use a 17 mm socket to remove plug (A) and O-ring (B) from the cutterbar. The oil level must be up to the inspection plug hole.

#### NOTE:

If additional lubricant is required, proceed to Step 8, page 86. If additional lubricant is **NOT** required, proceed to Step 15, page 87.

#### IMPORTANT:

Do **NOT** overfill the cutterbar. Overfilling can cause overheating, damage, or failure of the cutterbar components.

8. Reinstall the inspection plug.

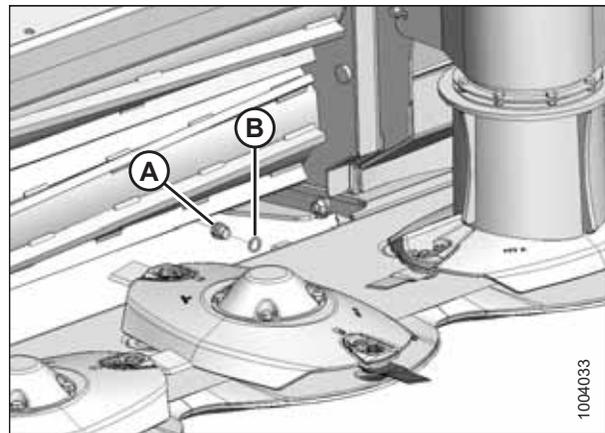


Figure 10.21: Cutterbar Oil Inspection Plug

### CAUTION

Never start or move the machine until you are sure all bystanders have cleared the area.

## PERFORMING PREDELIVERY CHECKS

9. Clear all bystanders from the area.
10. Start the engine, and raise the header slightly.
11. Lower the header onto blocks, so the left end is slightly higher than the right end.
12. Shut down the engine, and remove the key from the ignition.
13. Add lubricant through the inspection hole used to check the oil level.

**IMPORTANT:**

Do **NOT** overfill the cutterbar. Overfilling can cause overheating, damage, or failure of cutterbar components.

**NOTE:**

For lubricant specifications, refer to [11.1 Recommended Lubricants, page 97](#).

14. Recheck the oil level.
15. Check O-ring (B) for breaks or cracks, and replace if necessary.
16. Install plug (A) and O-ring (B). Tighten securely.
17. Close the cutterbar doors.

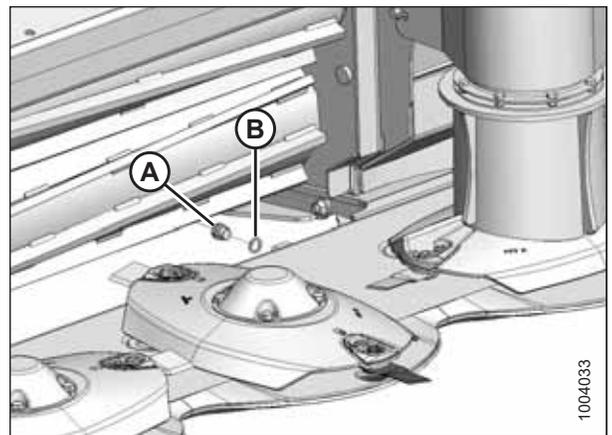


Figure 10.22: Cutterbar Oil Inspection Plug

## 10.9 Checking Roll Gap

Check factory-set roll gap as follows:

### WARNING

To avoid bodily injury or death from the unexpected startup of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Lower the disc header to the ground.
2. Shut down the engine, and remove the key from the ignition.
3. **Steel Rolls:** The length of thread (A) extending above the jam nut on the adjustment rods can be used as an approximation of roll gap, but does **NOT** provide consistent roll gap measurements. To ensure roll gap is at the factory setting, refer to *10.9.1 Adjusting Roll Gap – Steel Rolls, page 88*.
4. **Polyurethane Rolls:** Insert a feeler gauge between rolls from either front or rear of header. Factory setting is 3 mm (1/8 in.). If adjustments are required, refer to *10.9.2 Adjusting Roll Gap – Polyurethane Rolls, page 89*.

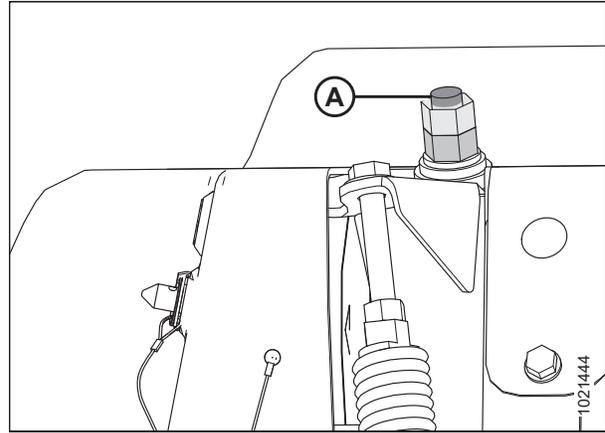


Figure 10.23: Roll Gap Adjustment

### 10.9.1 Adjusting Roll Gap – Steel Rolls

The length of thread extending above the jam nut on the adjustment rods can be used as an approximation of roll gap but does **NOT** provide consistent roll gap measurements. To ensure the roll gap is at the factory setting, follow the procedure below:

### WARNING

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Lower the header fully.
2. Shut down the engine, and remove the key from the ignition.

## PERFORMING PREDELIVERY CHECKS

3. Loosen jam nut (A) on both sides of the conditioner.
4. Turn lower nut (B) counterclockwise until the upper roll rests on the lower roll. Ensure the rolls intermesh.
5. Turn lower nut (B) two and a half full turns clockwise to raise the upper roll and achieve a 6 mm (1/4 in.) roll gap.
6. Hold nut (B) and tighten jam nut (A) on both sides of the conditioner.

### IMPORTANT:

Make sure the roll gap adjustment nuts are adjusted equally on both sides to achieve a consistent gap across the rolls.

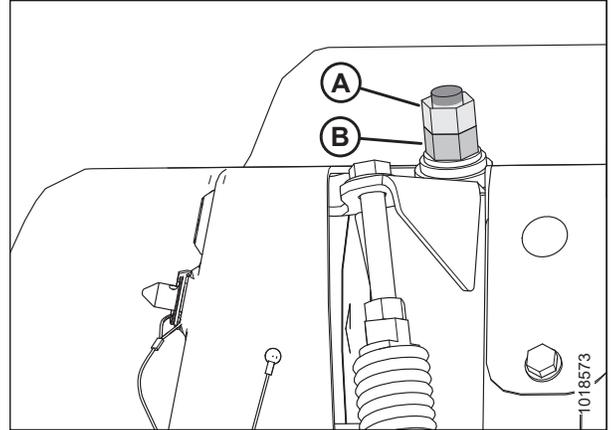


Figure 10.24: Roll Gap Adjustment

## 10.9.2 Adjusting Roll Gap – Polyurethane Rolls

### WARNING

To avoid injury or death from unexpected start-up of machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Lower the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Loosen upper jam nut (A) on both sides of the conditioner attachment.
4. Turn lower nut (B) counterclockwise until the upper roll rests on the lower roll.
5. Turn lower nut (B) one full turn clockwise to raise the upper roll and achieve a 3 mm (1/8 in.) roll gap.
6. Hold nut (B) and tighten jam nut (A) on both sides of the conditioner attachment.

### IMPORTANT:

Make sure the roll gap adjustment nuts are adjusted equally on both sides to achieve a consistent gap across the rolls.

7. Rotate the rolls manually and use a feeler gauge at the ends of the rolls to check that the actual gap is no less than 2 mm (5/64 in.) and no more than 4 mm (5/32 in.).

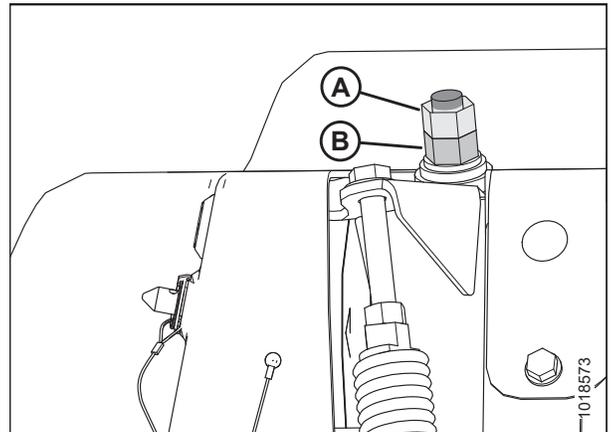


Figure 10.25: Roll Gap Adjustment

## 10.10 Checking Roll Tension

Roll tension is indicated by the exposed thread on the roll tension adjuster bolt.

1. Measure the amount of exposed thread on the roll tension adjuster bolt (A) at each end of the conditioner. Measurement (B) should be 12–15 mm (1/2–9/16 in.) for polyurethane and steel roll conditioners.
2. If the tension requires adjusting, refer to [10.10.1 Adjusting Roll Tension, page 90](#).

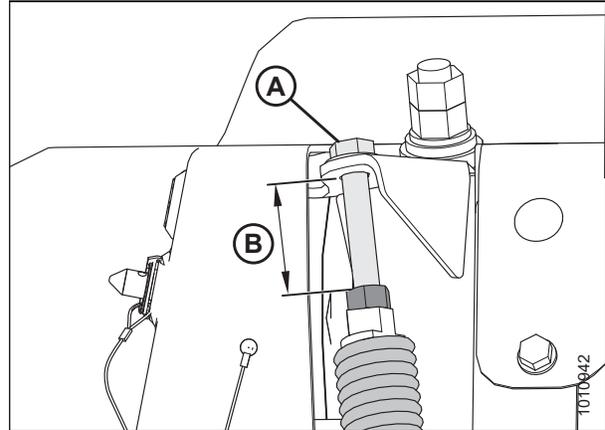


Figure 10.26: Roll Tension Adjuster

### 10.10.1 Adjusting Roll Tension

To adjust roll tension back to factory setting, follow these steps:

1. Lower the header fully.
2. Loosen jam nut (A) on both sides of conditioner.
3. Turn spring drawbolt (B) clockwise to tighten spring (C) and increase roll tension.
4. Turn spring drawbolt (B) counterclockwise to loosen spring (C) and decrease roll tension.
5. Measure the amount of exposed thread on spring drawbolt (B) at each end of the conditioner. Measurement (D) should be 12–15 mm (1/2–9/16 in.) for both polyurethane and steel roll conditioners.

**IMPORTANT:**

Turn each bolt equally. Each turn of the bolt changes the roll tension by approximately 32 N (7.2 lbf).

6. Tighten jam nuts (A) on each end of the conditioner.

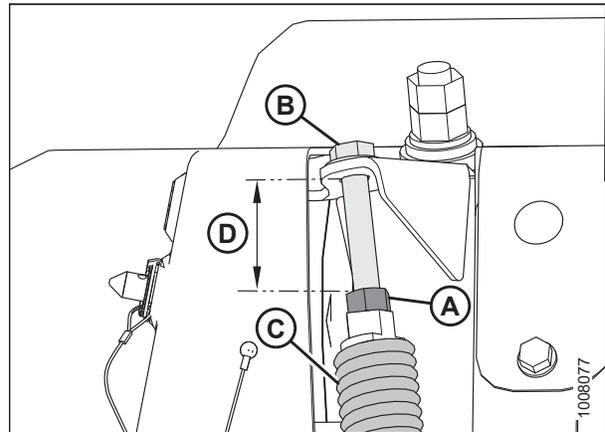


Figure 10.27: Adjusting Roll Tension

## 10.11 Adjusting Conditioner Baffle Position

The position of the adjustable conditioner baffle, along with the forming shields, determines the height and width of the windrow: raising the baffle produces a fluffier, narrower windrow; lowering the baffle produces a flatter, wider windrow.

1. Remove clip (A).
2. Move baffle adjustment handle (B) to the desired position on adjustment plate (C).
3. Install clip (A).

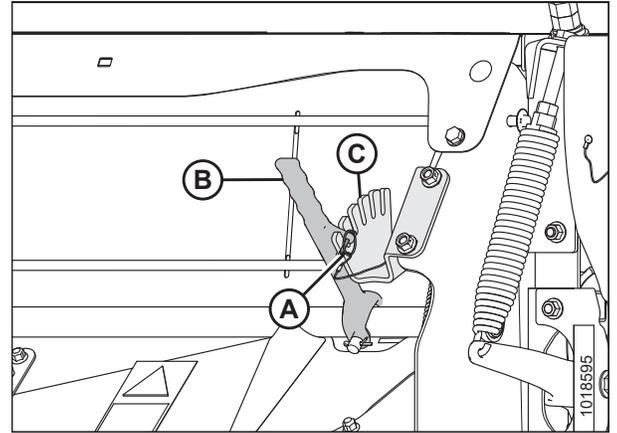


Figure 10.28: Conditioner Baffle Adjuster

## 10.12 Checking and Adjusting Forming Shield Deflector Position

The position of the side deflectors controls the width and placement of the windrow. Both side deflectors must be evenly set at the same position. If the side deflectors are not evenly set, follow the steps below to adjust them:

### DANGER

To avoid bodily injury or death from unexpected startup of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Loosen locking handle (A).
2. Slide adjuster bar (B) along adjuster plate (C) to the desired deflector position, and then engage bar (B) into a notch in the adjuster plate.
3. Tighten locking handle (A).
4. Repeat for the opposite side of the deflector.

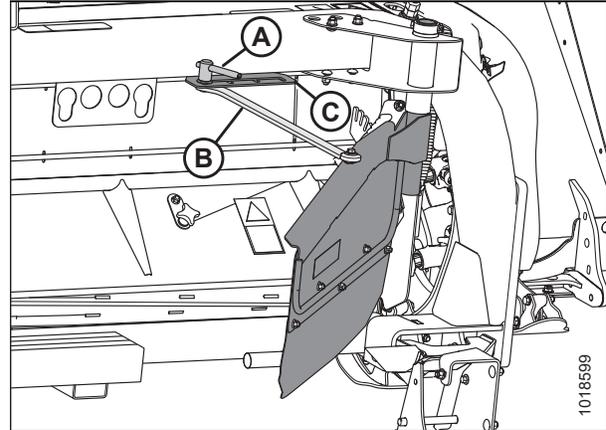


Figure 10.29: Right Forming Shield Side Deflector

## 10.13 Checking Lights

1. Check light mountings (A) for security and damage.
2. Check operation of hazard lights (B) during machine run-up.

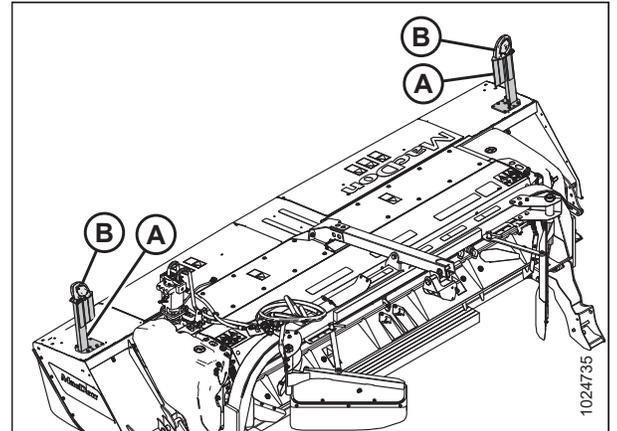


Figure 10.30: Lights

## 10.14 Checking Manuals

The following manuals should be stored in manual storage case (A) at the right end of the header:

- R1 Series Rotary Disc Header Operator's Manual
- R113 and R116 Rotary Disc Header Parts Catalog
- R1 Series Rotary Disc Header Quick Card

Open the right driveshield to access the manual case. For instructions, refer to [11.2 Opening Driveshields, page 98](#).

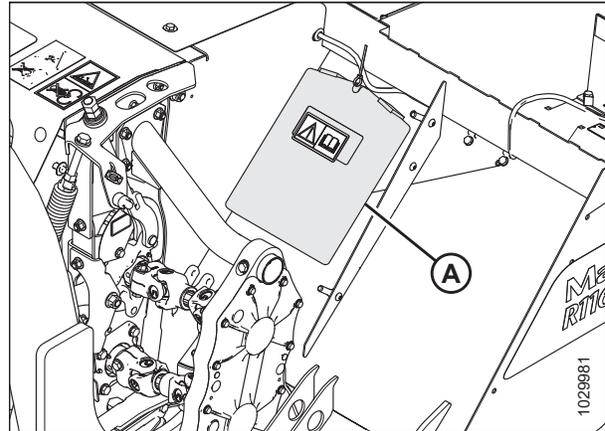


Figure 10.31: Manual Case

## 10.15 Running up the Header



### WARNING

- Keep everyone 100 m (330 ft.) away from your operation. Ensure bystanders are never in line with the front or rear of the machine. Stones and other foreign objects can be ejected from either end with force.
- Take extreme care to avoid injury from thrown objects. Do NOT, under any circumstances, operate the header when other people are nearby.
- Check cutterbar area carefully for loose parts and hardware on the cutterbar. These objects can be ejected with considerable force when the machine is started, and may result in serious injury or machine damage.
- Cutterbar curtains reduce the potential for thrown objects. Always keep these curtains down when operating the disc header. Replace the curtains if they become worn or damaged.



### WARNING

Before investigating an unusual sound or attempting to correct a problem, shut off engine, engage parking brake, and remove key.



### CAUTION

Never start or move the machine until you are sure all bystanders have cleared the area.

#### NOTE:

Higher engine rpm may be required to engage the rotary disc header. Do **NOT** exceed 1800 rpm.

1. Clear all bystanders from the area.
2. Start the windrower.
3. Set the rotary disc header 152–305 mm (6–12 in.) above the ground and adjust the center-link to mid-position.
4. Run the machine slowly for 5 minutes, and watch and listen **FROM THE OPERATOR'S SEAT** for binding or interfering parts.
5. Run the machine at operating speed for 15 minutes. Listen for any unusual sounds or abnormal vibration.
6. Perform the run-up check as listed on the Predelivery Checklist (the yellow sheet inside the back cover of this instruction) to ensure the machine is field-ready.
7. Shut down the engine, and remove the key from the ignition.
8. Retain the Predelivery Checklist and this instruction for future reference.



# Chapter 11: Reference

## 11.1 Recommended Lubricants

Keep your machine operating at top efficiency by using only clean lubricants and by ensuring the following:

- Use clean containers to handle all lubricants.
- Store lubricants in an area protected from dust, moisture, and other contaminants.

**IMPORTANT:**

Do **NOT** overfill the cutterbar when adding lubricant. Overfilling could result in overheating and failure of cutterbar components.

**Table 11.1 Recommended Lubricants**

Specification	Description	Use	Capacities
<b>Lubricant: Grease</b>			
SAE Multipurpose	High temperature extreme pressure (EP) performance with 1% max. molybdenum disulphide (NLGI Grade 2) lithium base	As required unless otherwise specified	—
SAE Multipurpose	High temperature extreme pressure (EP) performance with 10% max. molybdenum disulphide (NLGI Grade 2) lithium base	Driveline slip-joints	—
<b>Lubricant: Gear Lubricant</b>			
SAE 80W-90	High thermal and oxidation stability API service class GL-5	4.0 m (13 ft.) cutterbar	8 liters (8.5 qts [US])
SAE 85W-140	Fully Synthetic Oil API GL-5 Minimum, SAE J2360 Preferred	Conditioner roll timing gearbox	0.7 liters (0.75 qts [US])
SAE 80W-140	Fully Synthetic Oil API GL-5 Minimum, SAE J2360 Preferred	Header drive 90 degree gearbox	1.65 liters (1.74 qts [US])

## 11.2 Opening Driveshields

### CAUTION

To reduce the risk of personal injury, do NOT operate the machine without the driveshields in place and secured.

#### NOTE:

Images shown in this procedure are for the left driveshield—the right driveshield is similar.

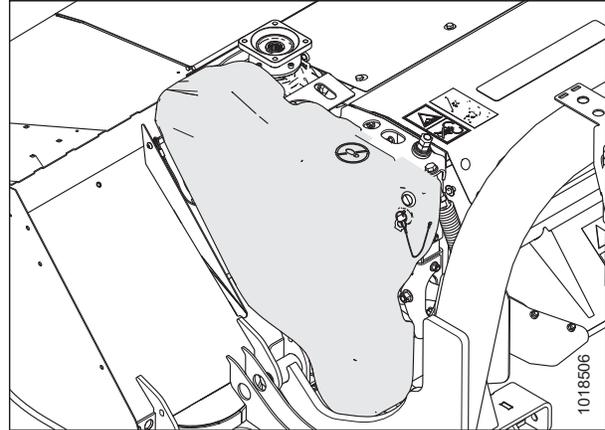


Figure 11.1: Left Driveshield

1. Shut down the engine, and remove the key from the ignition.
2. Remove lynch pin (A) and tool (B) from pin (C).

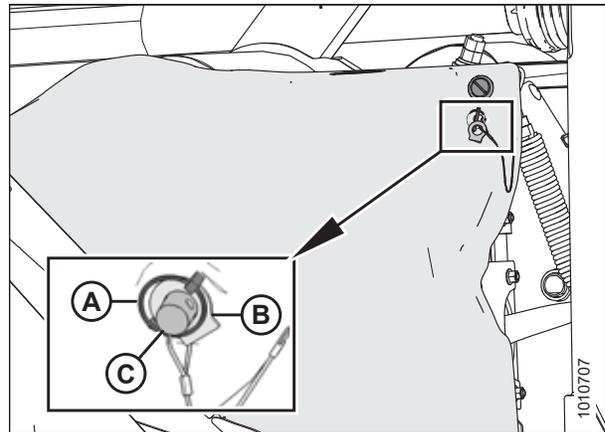


Figure 11.2: Left Driveshield

3. Insert flat end of tool (A) into latch (B) and turn it counterclockwise to unlock.

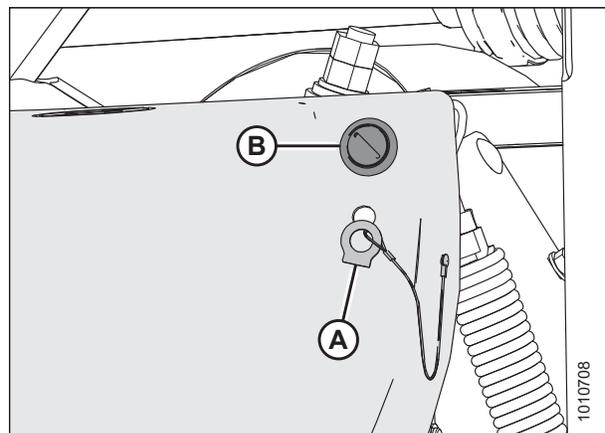


Figure 11.3: Driveshield Latch

## REFERENCE

4. Pull top of driveshield (A) away from the header to open.

**NOTE:**

For improved access, lift the driveshield off the pins at the base of the shield, and lay the shield on the header.

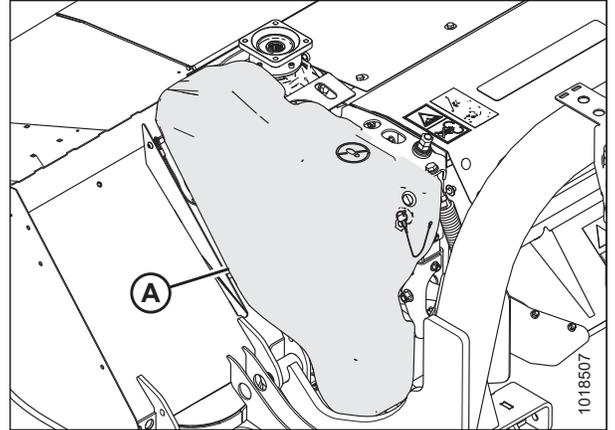


Figure 11.4: Left Driveshield

## 11.3 Closing Driveshields

### CAUTION

To reduce the risk of personal injury, do NOT operate the machine without the driveshields in place and secured.

#### NOTE:

Images shown in this procedure are for the left driveshield—the right driveshield is similar.

1. Position driveshield onto pins (if necessary).
2. Push driveshield (A) to engage latch (B).
3. Ensure the driveshield is properly secured.

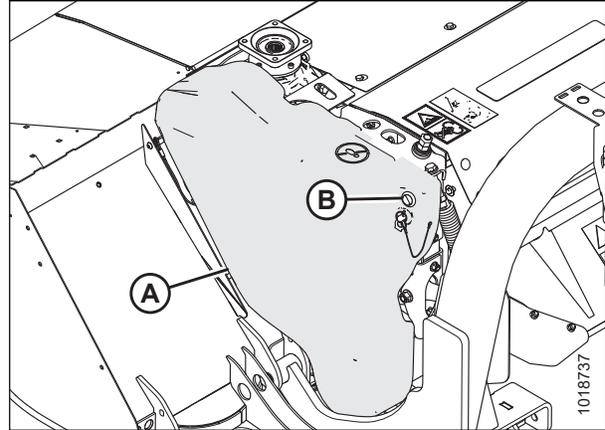


Figure 11.5: Left Driveshield

4. Replace tool (B) and lynch pin (A) on pin (C).

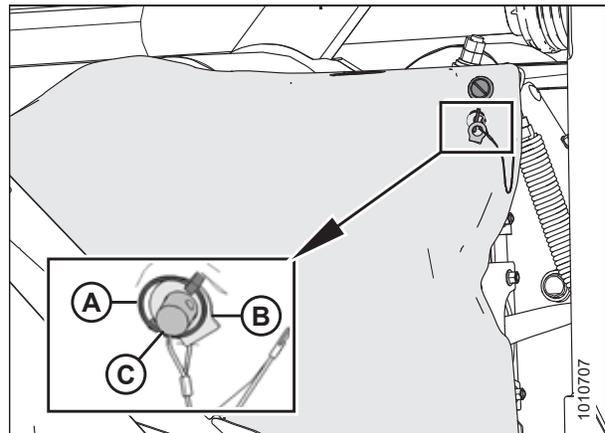


Figure 11.6: Left Driveshield

## 11.4 Cutterbar Doors

### WARNING

To reduce the risk of personal injury and machine damage, do NOT operate the machine without all the cutterbar doors down or without curtains installed and in good condition. Foreign objects can be ejected with considerable force when the machine is started.

Two doors (A) with rubber curtains provide access to the cutterbar area.

Rotary disc headers sold outside of North America have latches on the cutterbar door.

Curtains (B) and (C) are attached to each front corner and at the center respectively. Always keep curtains lowered when operating the rotary disc header.

#### IMPORTANT:

Replace curtains if they become worn or damaged.

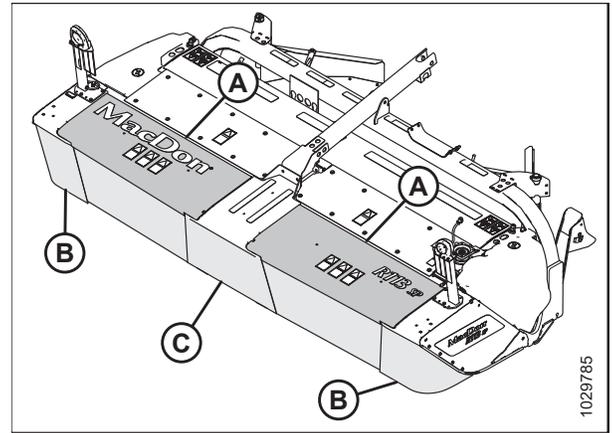


Figure 11.7: Cutterbar Doors and Curtains – R113 SP Shown, R116 SP Similar

### 11.4.1 Opening Cutterbar Doors

If the machine was sold outside of North America, it will have export latches. For instructions, refer to [11.4.2 Opening Cutterbar Doors – Export Latches, page 102](#).

### WARNING

To avoid bodily injury or death from unexpected startup of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Shut down the engine, and remove the key from the ignition.
2. Lift up doors (A) at the front of the machine.

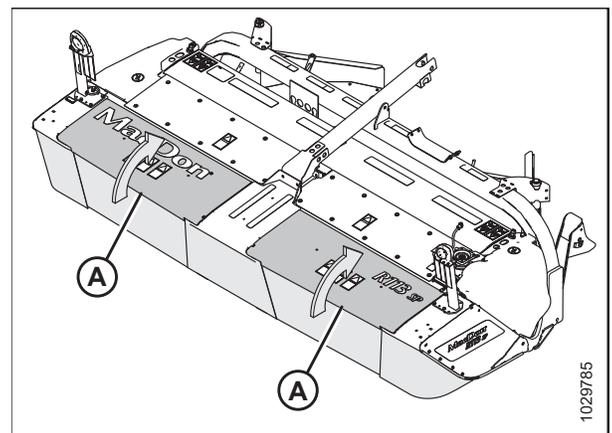


Figure 11.8: Cutterbar Doors and Curtains – R113 SP Shown, R116 SP Similar

## 11.4.2 Opening Cutterbar Doors – Export Latches

Machines sold outside North America have a tool-operated latch on the cutterbar doors. Follow these steps to open cutterbar doors with export latches:

### WARNING

To avoid bodily injury or death from unexpected startup of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Shut down the engine, and remove the key from the ignition.
2. Locate latch access holes (A) for each door.

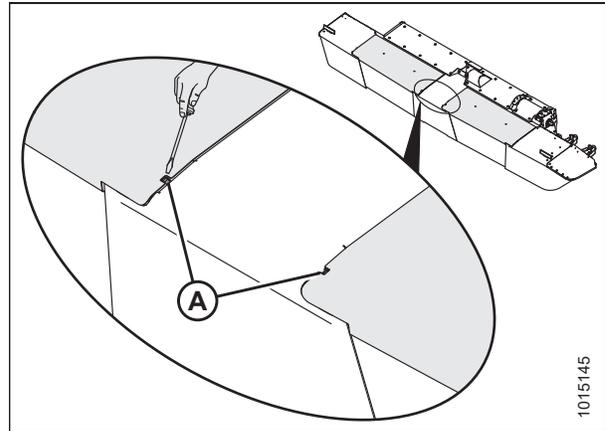


Figure 11.9: Cutterbar Door Latch Access Hole – Export Only

3. Use a rod or screwdriver to press down on latch (A) and release the cutterbar door.

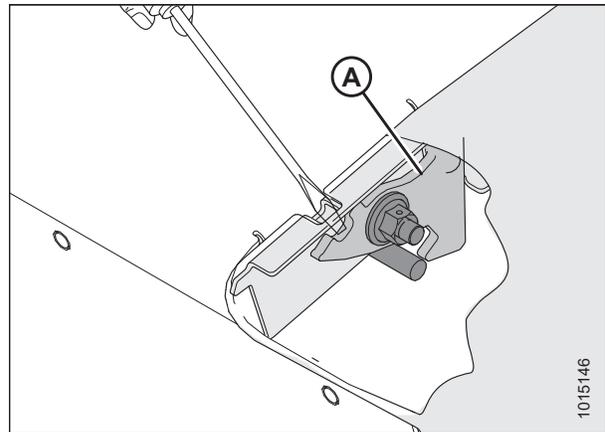


Figure 11.10: Cutterbar Door Latch – Cutaway View

## REFERENCE

4. Lift up on doors (A) while pressing down on the latch.

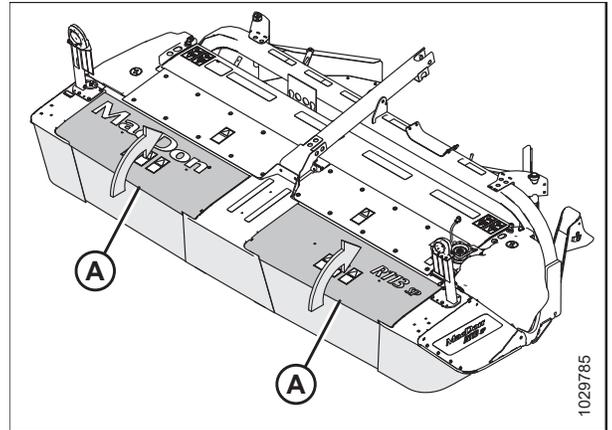


Figure 11.11: R113 SP Cutterbar Doors Shown, R116 SP Similar

### 11.4.3 Closing Cutterbar Doors

#### CAUTION

To avoid injury, keep hands and fingers away from corners of doors when closing.

1. Pull down on door (A) from the top to close.
2. Ensure that curtains hang properly and completely enclose the cutterbar area.

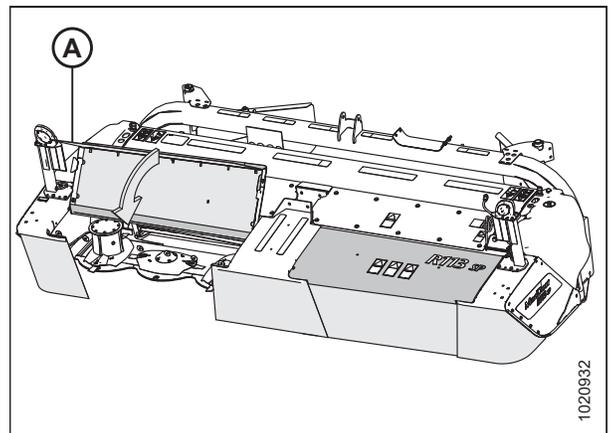


Figure 11.12: Cutterbar Doors and Curtains

## 11.5 Torque Specifications

The following tables provide correct torque values for various bolts, cap screws, and hydraulic fittings.

- Tighten all bolts to torque values specified in charts (unless otherwise noted throughout this manual).
- Replace hardware with same strength and grade of bolt.
- Use torque value tables as a guide and periodically check tightness of bolts.
- Understand torque categories for bolts and cap screws by using their identifying head markings.

### Jam nuts

When applying torque to finished jam nuts, multiply the torque applied to regular nuts by  $f=0.65$ .

### Self-tapping screws

Standard torque is to be used (**NOT** to be used on critical or structurally important joints).

### 11.5.1 Metric Bolt Specifications

Table 11.2 Metric Class 8.8 Bolts and Class 9 Free Spinning Nut

Nominal Size (A)	Torque (Nm)		Torque (lbf-ft) (*lbf-in)	
	Min.	Max.	Min.	Max.
3-0.5	1.4	1.6	*13	*14
3.5-0.6	2.2	2.5	*20	*22
4-0.7	3.3	3.7	*29	*32
5-0.8	6.7	7.4	*59	*66
6-1.0	11.4	12.6	*101	*112
8-1.25	28	30	20	23
10-1.5	55	60	40	45
12-1.75	95	105	70	78
14-2.0	152	168	113	124
16-2.0	236	261	175	193
20-2.5	460	509	341	377
24-3.0	796	879	589	651

Table 11.3 Metric Class 8.8 Bolts and Class 9 Distorted Thread Nut

Nominal Size (A)	Torque (Nm)		Torque (lbf-ft) (*lbf-in)	
	Min.	Max.	Min.	Max.
3-0.5	1	1.1	*9	*10
3.5-0.6	1.5	1.7	*14	*15
4-0.7	2.3	2.5	*20	*22
5-0.8	4.5	5	*40	*45
6-1.0	7.7	8.6	*69	*76
8-1.25	18.8	20.8	*167	*185
10-1.5	37	41	28	30
12-1.75	65	72	48	53

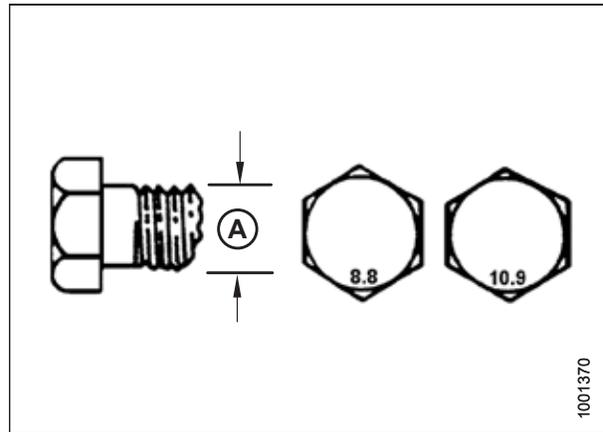


Figure 11.13: Bolt Grades

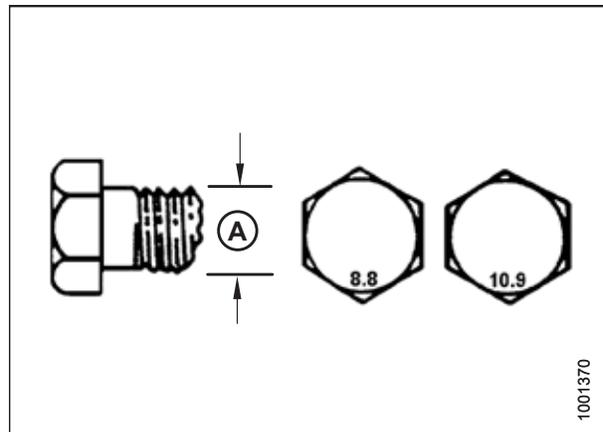


Figure 11.14: Bolt Grades

REFERENCE

**Table 11.3 Metric Class 8.8 Bolts and Class 9 Distorted Thread Nut (continued)**

Nominal Size (A)	Torque (Nm)		Torque (lbf-ft) (*lbf-in)	
	Min.	Max.	Min.	Max.
14-2.0	104	115	77	85
16-2.0	161	178	119	132
20-2.5	314	347	233	257
24-3.0	543	600	402	444

**Table 11.4 Metric Class 10.9 Bolts and Class 10 Free Spinning Nut**

Nominal Size (A)	Torque (Nm)		Torque (lbf-ft) (*lbf-in)	
	Min.	Max.	Min.	Max.
3-0.5	1.8	2	*18	*19
3.5-0.6	2.8	3.1	*27	*30
4-0.7	4.2	4.6	*41	*45
5-0.8	8.4	9.3	*82	*91
6-1.0	14.3	15.8	*140	*154
8-1.25	38	42	28	31
10-1.5	75	83	56	62
12-1.75	132	145	97	108
14-2.0	210	232	156	172
16-2.0	326	360	242	267
20-2.5	637	704	472	521
24-3.0	1101	1217	815	901

**Table 11.5 Metric Class 10.9 Bolts and Class 10 Distorted Thread Nut**

Nominal Size (A)	Torque (Nm)		Torque (lbf-ft) (*lbf-in)	
	Min.	Max.	Min.	Max.
3-0.5	1.3	1.5	*12	*13
3.5-0.6	2.1	2.3	*19	*21
4-0.7	3.1	3.4	*28	*31
5-0.8	6.3	7	*56	*62
6-1.0	10.7	11.8	*95	*105
8-1.25	26	29	19	21
10-1.5	51	57	38	42
12-1.75	90	99	66	73
14-2.0	143	158	106	117
16-2.0	222	246	165	182
20-2.5	434	480	322	356
24-3.0	750	829	556	614

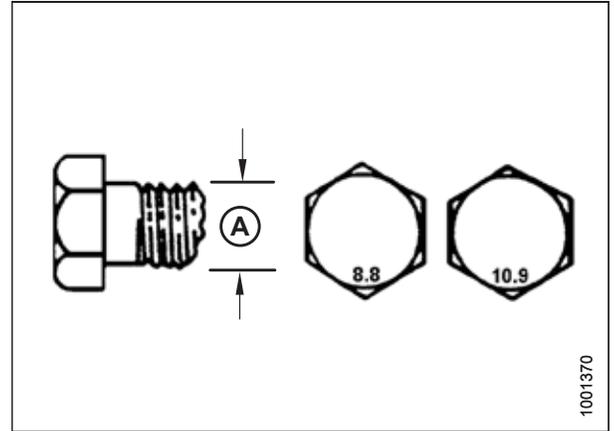


Figure 11.15: Bolt Grades

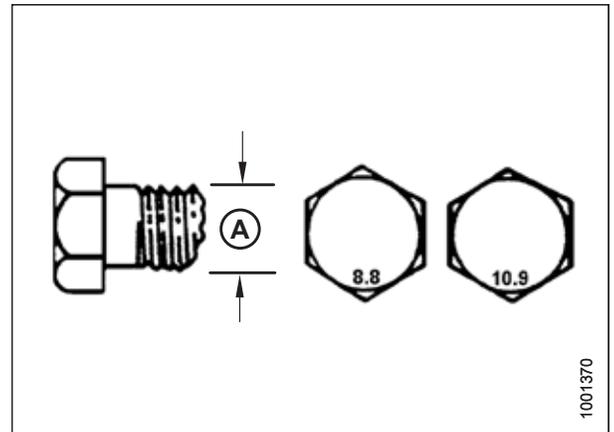


Figure 11.16: Bolt Grades

### 11.5.2 Metric Bolt Specifications Bolting into Cast Aluminum

Table 11.6 Metric Bolt Bolting into Cast Aluminum

Nominal Size (A)	Bolt Torque			
	8.8 (Cast Aluminum)		10.9 (Cast Aluminum)	
	Nm	lbf-ft	Nm	lbf-ft
M3	–	–	–	1
M4	–	–	4	2.6
M5	–	–	8	5.5
M6	9	6	12	9
M8	20	14	28	20
M10	40	28	55	40
M12	70	52	100	73
M14	–	–	–	–
M16	–	–	–	–

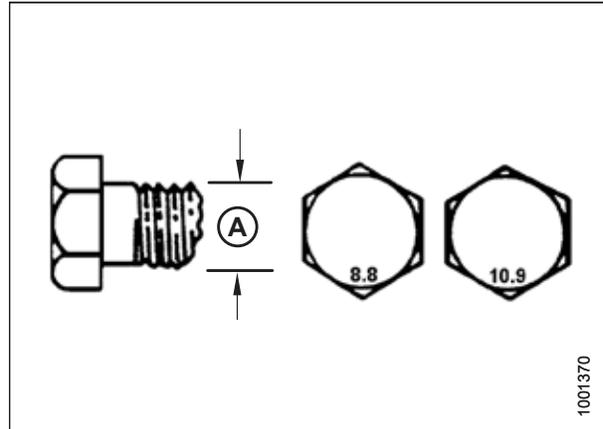


Figure 11.17: Bolt Grades

### 11.5.3 O-Ring Boss Hydraulic Fittings – Adjustable

1. Inspect O-ring (A) and seat (B) for dirt or obvious defects.
2. Back off lock nut (C) as far as possible. Ensure that washer (D) is loose and is pushed toward lock nut (C) as far as possible.
3. Check that O-ring (A) is **NOT** on threads and adjust if necessary.
4. Apply hydraulic system oil to O-ring (A).

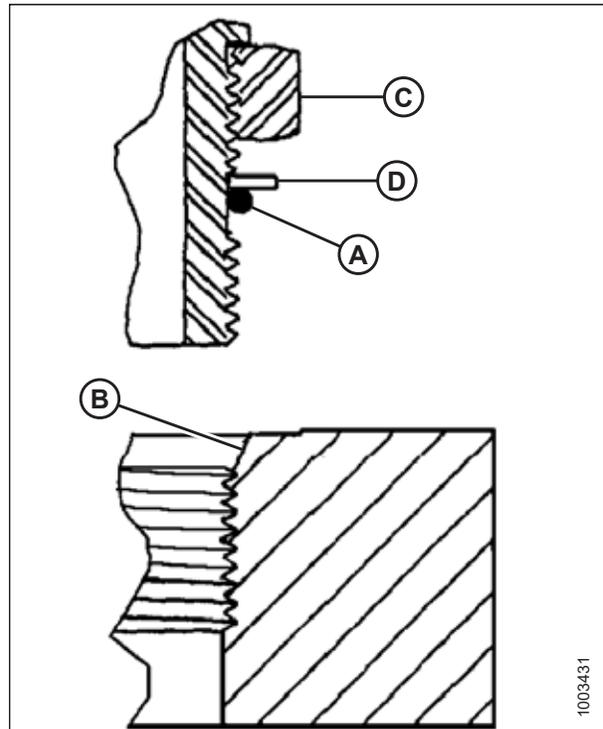


Figure 11.18: Hydraulic Fitting

REFERENCE

5. Install fitting (B) into port until backup washer (D) and O-ring (A) contact part face (E).
6. Position angle fittings by unscrewing no more than one turn.
7. Turn lock nut (C) down to washer (D) and tighten to torque shown. Use two wrenches, one on fitting (B) and other on lock nut (C).
8. Check final condition of fitting.

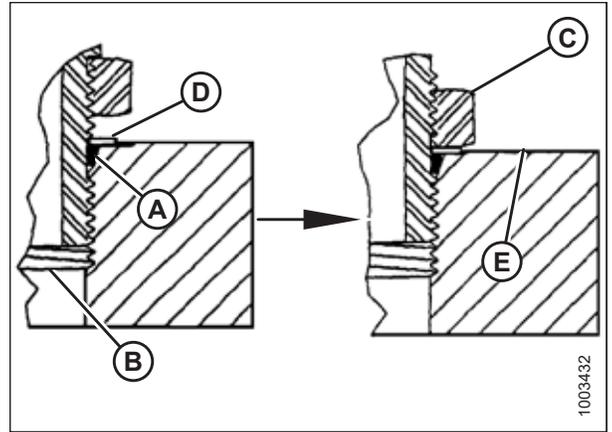


Figure 11.19: Hydraulic Fitting

Table 11.7 O-Ring Boss (ORB) Hydraulic Fittings – Adjustable

SAE Dash Size	Thread Size (in.)	Torque Value <sup>3</sup>	
		Nm	lbf·ft (*lbf·in)
-2	5/16-24	6-7	*53-62
-3	3/8-24	12-13	*106-115
-4	7/16-20	19-21	14-15
-5	1/2-20	21-33	15-24
-6	9/16-18	26-29	19-21
-8	3/4-16	46-50	34-37
-10	7/8-14	75-82	55-60
-12	1 1/16-12	120-132	88-97
-14	1 3/8-12	153-168	113-124
-16	1 5/16-12	176-193	130-142
-20	1 5/8-12	221-243	163-179
-24	1 7/8-12	270-298	199-220
-32	2 1/2-12	332-365	245-269

3. Torque values shown are based on lubricated connections as in reassembly.

REFERENCE

### 11.5.4 O-Ring Boss Hydraulic Fittings – Non-Adjustable

1. Inspect O-ring (A) and seat (B) for dirt or obvious defects.
2. Check that O-ring (A) is **NOT** on threads and adjust if necessary.
3. Apply hydraulic system oil to O-ring.
4. Install fitting (C) into port until fitting is hand-tight.
5. Torque fitting (C) according to values in Table 11.8, page 108.
6. Check final condition of fitting.

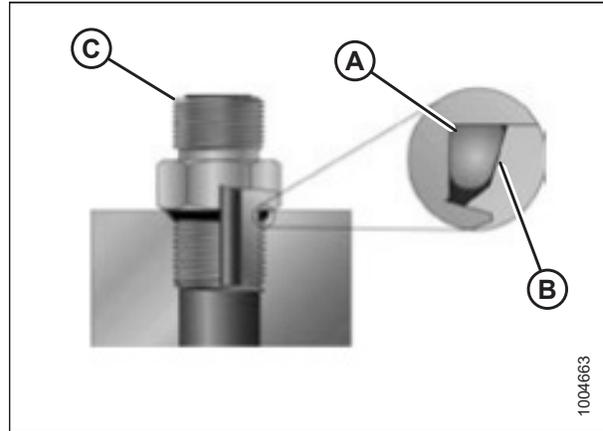


Figure 11.20: Hydraulic Fitting

Table 11.8 O-Ring Boss (ORB) Hydraulic Fittings – Non-Adjustable

SAE Dash Size	Thread Size (in.)	Torque Value <sup>4</sup>	
		Nm	lbf-ft (*lbf-in)
-2	5/16-24	6-7	*53-62
-3	3/8-24	12-13	*106-115
-4	7/16-20	19-21	14-15
-5	1/2-20	21-33	15-24
-6	9/16-18	26-29	19-21
-8	3/4-16	46-50	34-37
-10	7/8-14	75-82	55-60
-12	1 1/16-12	120-132	88-97
-14	1 3/8-12	153-168	113-124
-16	1 5/16-12	176-193	130-142
-20	1 5/8-12	221-243	163-179
-24	1 7/8-12	270-298	199-220
-32	2 1/2-12	332-365	245-269

4. Torque values shown are based on lubricated connections as in reassembly.

### 11.5.5 O-Ring Face Seal Hydraulic Fittings

1. Check components to ensure that sealing surfaces and fitting threads are free of burrs, nicks, scratches, or any foreign material.



Figure 11.21: Hydraulic Fitting

2. Apply hydraulic system oil to O-ring (B).
3. Align tube or hose assembly so that flat face of sleeve (A) or (C) comes in full contact with O-ring (B).
4. Thread tube or hose nut (D) until hand-tight. The nut should turn freely until it is bottomed out.
5. Torque fittings according to values in Table 11.9, page 109.

**NOTE:**

If applicable, hold hex on fitting body (E) to prevent rotation of fitting body and hose when tightening fitting nut (D).

6. Use three wrenches when assembling unions or joining two hoses together.
7. Check final condition of fitting.

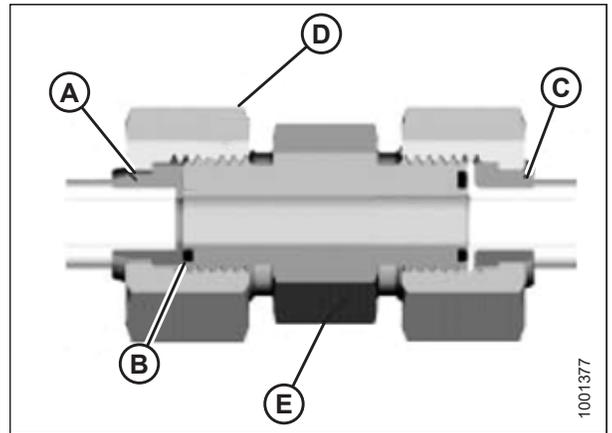


Figure 11.22: Hydraulic Fitting

**Table 11.9 O-Ring Face Seal (ORFS) Hydraulic Fittings**

SAE Dash Size	Thread Size (in.)	Tube O.D. (in.)	Torque Value <sup>5</sup>	
			Nm	lbf-ft
-3	Note <sup>6</sup>	3/16	–	–
-4	9/16	1/4	25–28	18–21
-5	Note <sup>6</sup>	5/16	–	–
-6	11/16	3/8	40–44	29–32
-8	13/16	1/2	55–61	41–45
-10	1	5/8	80–88	59–65
-12	1 3/16	3/4	115–127	85–94
-14	Note <sup>6</sup>	7/8	–	–

5. Torque values and angles shown are based on lubricated connection as in reassembly.

6. O-ring face seal type end not defined for this tube size.

**REFERENCE**

**Table 11.9 O-Ring Face Seal (ORFS) Hydraulic Fittings (continued)**

SAE Dash Size	Thread Size (in.)	Tube O.D. (in.)	Torque Value <sup>7</sup>	
			Nm	lbf-ft
-16	1 7/16	1	150–165	111–122
-20	1 11/16	1 1/4	205–226	151–167
-24	1–2	1 1/2	315–347	232–256
-32	2 1/2	2	510–561	376–414

### 11.5.6 Tapered Pipe Thread Fittings

Assemble pipe fittings as follows:

1. Check components to ensure that fitting and port threads are free of burrs, nicks, scratches, or any form of contamination.
2. Apply pipe thread sealant (paste type) to external pipe threads.
3. Thread fitting into port until hand-tight.
4. Torque connector to appropriate torque angle. The turns from finger tight (TFFT) and flats from finger tight (FFFT) values are shown in Table 11.10, page 110. Make sure that tube end of a shaped connector (typically 45° or 90°) is aligned to receive incoming tube or hose assembly. Always finish alignment of fitting in tightening direction. Never back off (loosen) pipe threaded connectors to achieve alignment.
5. Clean all residue and any excess thread conditioner with appropriate cleaner.
6. Assess final condition of fitting. Pay special attention to possibility of cracks to port opening.
7. Mark final position of fitting. If a fitting leaks, disassemble fitting and check for damage.

**NOTE:**

Overtorque failure of fittings may not be evident until fittings are disassembled.

**Table 11.10 Hydraulic Fitting Pipe Thread**

Tapered Pipe Thread Size	Recommended TFFT	Recommended FFFT
1/8–27	2–3	12–18
1/4–18	2–3	12–18
3/8–18	2–3	12–18
1/2–14	2–3	12–18
3/4–14	1.5–2.5	12–18
1–11 1/2	1.5–2.5	9–15
1 1/4–11 1/2	1.5–2.5	9–15
1 1/2–11 1/2	1.5–2.5	9–15
2–11 1/2	1.5–2.5	9–15

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7. Torque values and angles shown are based on lubricated connection as in reassembly.

## 11.6 Conversion Chart

Table 11.11 Conversion Chart

Quantity	SI Units (Metric)		Factor	US Customary Units (Standard)	
	Unit Name	Abbreviation		Unit Name	Abbreviation
Area	hectare	ha	$\times 2.4710 =$	acre	acres
Flow	liters per minute	L/min	$\times 0.2642 =$	US gallons per minute	gpm
Force	Newton	N	$\times 0.2248 =$	pound force	lbf
Length	millimeter	mm	$\times 0.0394 =$	inch	in.
Length	meter	m	$\times 3.2808 =$	foot	ft.
Power	kilowatt	kW	$\times 1.341 =$	horsepower	hp
Pressure	kilopascal	kPa	$\times 0.145 =$	pounds per square inch	psi
Pressure	megapascal	MPa	$\times 145.038 =$	pounds per square inch	psi
Pressure	bar (Non-SI)	bar	$\times 14.5038 =$	pounds per square inch	psi
Torque	Newton meter	Nm	$\times 0.7376 =$	pound feet or foot pounds	lbf-ft
Torque	Newton meter	Nm	$\times 8.8507 =$	pound inches or inch pounds	lbf-in
Temperature	degrees Celsius	°C	$(^{\circ}\text{C} \times 1.8) + 32 =$	degrees Fahrenheit	°F
Velocity	meters per minute	m/min	$\times 3.2808 =$	feet per minute	ft/min
Velocity	meters per second	m/s	$\times 3.2808 =$	feet per second	ft/s
Velocity	kilometers per hour	km/h	$\times 0.6214 =$	miles per hour	mph
Volume	liter	L	$\times 0.2642 =$	US gallon	US gal
Volume	milliliter	mL	$\times 0.0338 =$	ounce	oz.
Volume	cubic centimeter	cm <sup>3</sup> or cc	$\times 0.061 =$	cubic inch	in. <sup>3</sup>
Weight	kilogram	kg	$\times 2.2046 =$	pound	lb.

**REFERENCE**

## 11.7 Definitions

The following terms and acronyms may be used in this instruction:

<b>Term</b>	<b>Definition</b>
API	American Petroleum Institute
ASTM	American Society of Testing and Materials
Bolt	A headed and externally threaded fastener that is designed to be paired with a nut
Cab-forward	Windrower operation with Operator and cab facing in direction of travel
Center-link	A hydraulic cylinder link between the header and machine used to change header angle
CGVW	Combined gross vehicle weight
Export header	Header configuration typical outside North America
FFFT	Flats from finger tight
Finger tight	Finger tight is a reference position where sealing surfaces or components are making contact with each other, and fitting has been tightened to a point where fitting is no longer loose
GVW	Gross vehicle weight
Hard joint	A joint made with use of a fastener where joining materials are highly incompressible
Header	A machine that cuts and lays crop into a windrow and is attached to a windrower
Hex key	A tool of hexagonal cross-section used to drive bolts and screws that have a hexagonal socket in head (internal-wrenching hexagon drive); also known as an Allen key and various other synonyms
hp	Horsepower
JIC	Joint Industrial Council: A standards body that developed standard sizing and shape for original 37° flared fitting
M Series windrower	MacDon M100, M105, M150, M155, M155E4, M200, and M205 windrowers
M1 Series	MacDon M1170 and M1240 Windrowers
n/a	Not applicable
North American header	Header configuration typical in North America
NPT	National Pipe Thread: A style of fitting used for low-pressure port openings. Threads on NPT fittings are uniquely tapered for an interference fit
Nut	An internally threaded fastener that is designed to be paired with a bolt
ORB	O-ring boss: A style of fitting commonly used in port openings on manifolds, pumps, and motors
ORFS	O-ring face seal: A style of fitting commonly used for connecting hoses and tubes. This style of fitting is also commonly called ORS, which stands for O-ring seal
R1 SP Series	MacDon R113 and R116 Rotary Disc Headers for windrowers
rpm	Revolutions per minute
SAE	Society of Automotive Engineers
Screw	A headed and externally threaded fastener that threads into preformed threads or forms its own thread into a mating part

## REFERENCE

Term	Definition
Soft joint	A joint made with use of a fastener where joining materials are compressible or experience relaxation over a period of time
Tension	Axial load placed on a bolt or screw, usually measured in Newtons (N) or pounds (lb.)
TFFT	Turns from finger tight
Torque	The product of a force X lever arm length, usually measured in Newton-meters (Nm) or foot-pounds (lb-ft)
Torque angle	A tightening procedure where fitting is assembled to a precondition (finger tight) and then nut is turned farther a number of degrees to achieve its final position
Torque-tension	The relationship between assembly torque applied to a piece of hardware and axial load it induces in bolt or screw
Washer	A thin cylinder with a hole or slot located in the center that is to be used as a spacer, load distribution element, or locking mechanism
Windrower	Power unit for a header

# Predelivery Checklist

Perform these checks and adjustments before delivering the machine to your Customer. If adjustments are required, refer to the appropriate page number in this manual. The completed Checklist should be retained by either the Operator or the Dealer.

## WARNING

Do NOT operate the machine with the driveshields open. High speed rotating components may throw debris and could result in death or serious injury.

## CAUTION

Carefully follow the instructions given. Be alert for safety-related messages that bring your attention to hazards and unsafe practices.

Serial Number:

---

Table .12 Predelivery Checklist

✓	Item	Reference
	Check for shipping damage or missing parts. Be sure all shipping dunnage is removed.	—
	Check for loose hardware. Tighten to required torque if applicable.	<i>11.5 Torque Specifications, page 104</i>
	Check main drive belt tension.	<i>10.1 Checking Conditioner Drive Belt, page 73</i>
	Check skid shoes are evenly set.	<i>10.2 Checking Skid Shoes, page 75</i>
	Check side forming shields evenly set to desired position.	<i>10.12 Checking and Adjusting Forming Shield Deflector Position, page 92</i>
	Check rear baffle is about mid-position.	<i>10.11 Adjusting Conditioner Baffle Position, page 91</i>
	Check conditioner roll gap (roll conditioner).	<i>10.9 Checking Roll Gap, page 88</i>
	Check conditioner roll tension (roll conditioner).	
	Check conditioner roll timing hardware is securely tightened (roll conditioner).	<i>10.5 Checking Roll Timing, page 80</i>
	Check that cutterbar doors are unbolted from centre channel frame, shipping wire is removed from cutterbar curtains, and cutterbar curtains are hanging properly.	<i>7 Unpacking Curtains, page 65</i>
	Grease all bearings and drivelines.	<i>9.1 Lubrication Locations, page 72</i>
	Check conditioner roll timing gearbox lubricant.	<i>10.6 Checking and Adding Lubricant – Conditioner Roll Timing Gearbox, page 83</i>
	Check cutterbar lubricant.	<i>10.8 Checking and Adding Lubricant – Cutterbar, page 86</i>

REFERENCE

Table .12 Predelivery Checklist (continued)

✓	Item	Reference
	<p>Check cutterbar area carefully for loose parts and hardware on the cutterbar.</p> <p> <b>WARNING</b></p> <p><b>These objects can be ejected with considerable force when the machine is started, and may result in serious injury or machine damage.</b></p>	—
<b>Run-Up Procedure</b>		<i>10.15 Running up the Header, page 95</i>
	Check hydraulic hose and wiring harness routing to ensure adequate clearance when raising or lowering header.	—
	Check hazard lights are functional.	<i>10.13 Checking Lights, page 93</i>
<b>Post Run-Up Check – Stop Engine</b>		
	Check belt drive for proper idler alignment and overheating bearings.	<i>10.1 Checking Conditioner Drive Belt, page 73</i>
	Check for hydraulic leaks.	—
	Check that header manuals are in storage compartment.	<i>10.14 Checking Manuals, page 94</i>

Date Checked:

Checked by:





**MacDon Industries Ltd.**

680 Moray Street  
Winnipeg, Manitoba  
Canada R3J 3S3  
t. (204) 885-5590 f. (204) 832-7749

**MacDon, Inc.**

10708 N. Pomona Avenue  
Kansas City, Missouri  
United States 64153-1924  
t. (816) 891-7313 f. (816) 891-7323

**MacDon Australia Pty. Ltd.**

A.C.N. 079 393 721  
P.O. Box 103 Somerton, Victoria, Australia  
Australia 3061  
t.+61 3 8301 1911 f.+61 3 8301 1912

**MacDon Brasil Agribusiness Ltda.**

Rua Grã Nicco, 113, sala 404, B. 04  
Mossunguê, Curitiba, Paraná  
CEP 81200-200 Brasil  
t. +55 (41) 2101-1713 f. +55 (41) 2101-1699

**LLC MacDon Russia Ltd.**

123317 Moscow, Russia  
10 Presnenskaya nab, Block C  
Floor 5, Office No. 534, Regus Business Centre  
t. +7 495 775 6971 f. +7 495 967 7600

**MacDon Europe GmbH**

Hagenauer Strasse 59  
65203 Wiesbaden  
Germany

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